SUPPLEMENT.

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No. 2503.—VOL. LIII. LONDON, SATURDAY, AUGUST 11, 1883. PRICE (WITH THE JOURNAL) SIXPENCE BY POST £1 4s. PER ANNUM.

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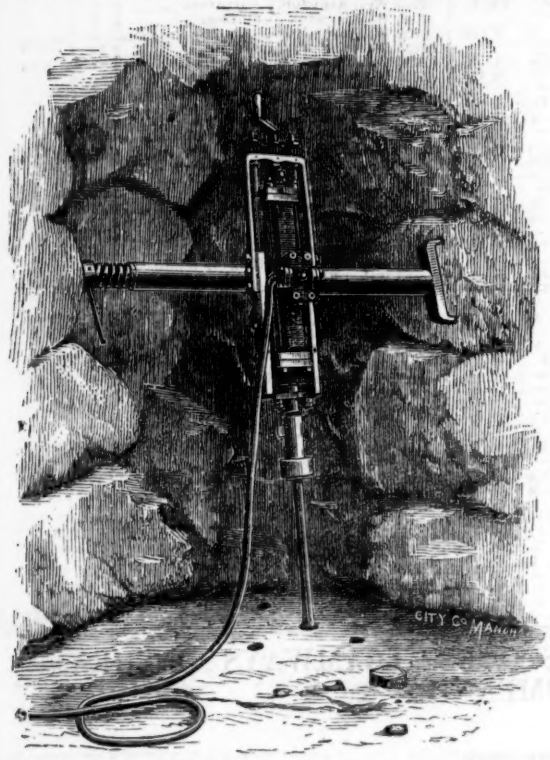

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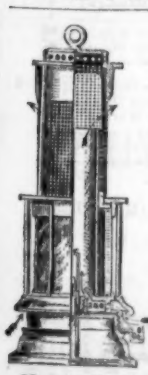

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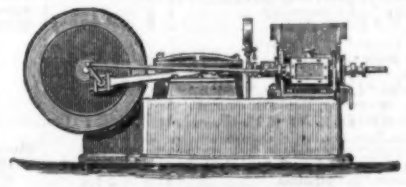

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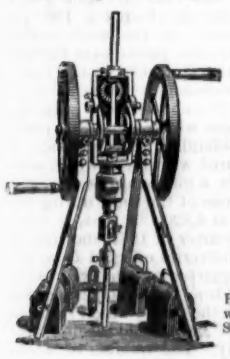

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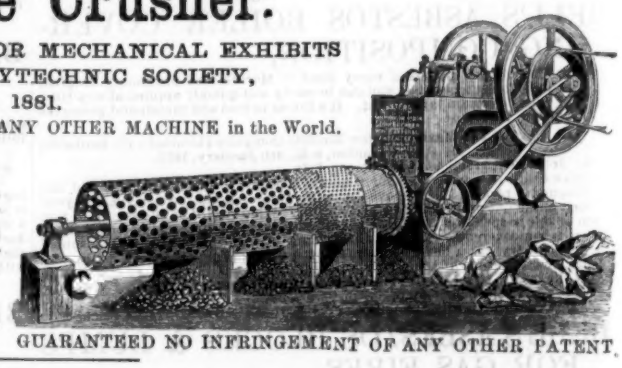
The above refers to one of our 16 by 9 Machines we supplied to replace an "Improved Blake" 15 by 9 Machine.



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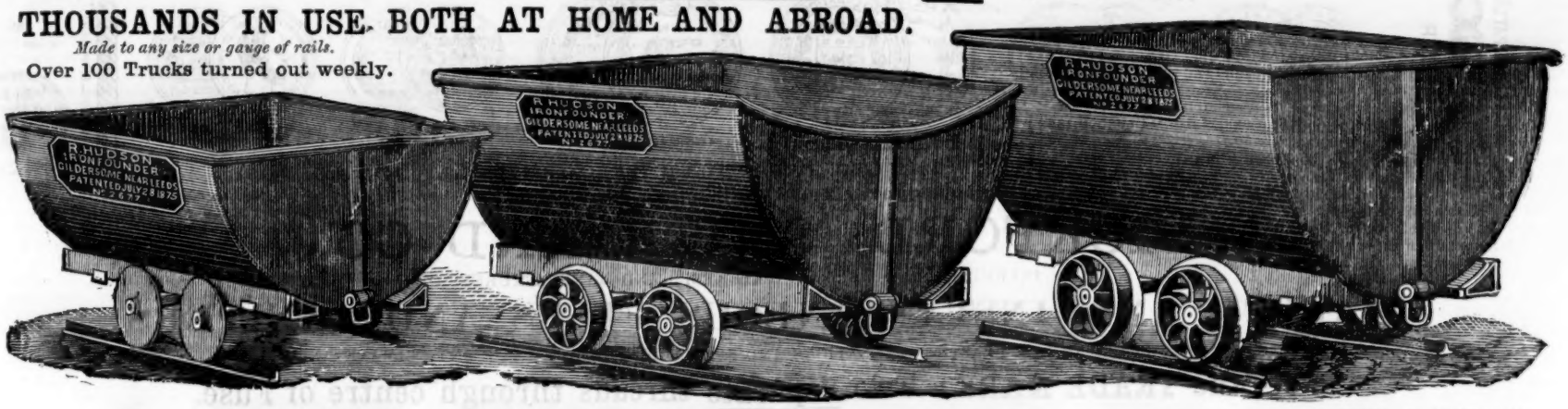

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Mr. J. Bell, Asbestos Works, London.

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I am, Sir, yours truly, J. ASHCROFT, Chief Engineer.

Mr. John Bell, Asbestos Works, London. Portsmouth, February 20, 1883.

Sir,—Your Asbestos Steam Packing that you have been supplying for some considerable time I can recommend to steam users generally as being the very best that was ever introduced into the market for piston glands, slide throttle and throttle valve glands. I can after considerable experience say that it is the very best that I have ever used. We run our engine at between 80 and 90 revolutions per minute, and I may add that there is no work more trying than saw mil work.

Yours truly, WM. HATCHER,
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A cheap material to be placed between ceiling and upper floor, to prevent spread of fire.

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For Coating the Boilers of every kind of Marine and Stationary Engine. It is non-combustible, and can be easily and quickly applied at any time whether steam is up or not. It adheres to iron and metals and preserves them from rust.

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Mr. John Bell, 118, Southwark Street, S.E.

Dear Sir,—In answer to your request, I beg to inform you that I find the thermometer placed 3 feet above the boilers now stands at 93°; before your covering was put on it used to stand at 126°. With regard to the saving in fuel I am unable to speak very accurately, as the boilers were not working long enough before being covered to ascertain the amount of fuel that would be consumed in an ordinary run; but I feel quite justified in saying that we burn less by about 5 cwts. per night than we were doing, and I shall be glad at any time to show the boilers to any one who may wish to see them, as I consider yours the best covering that I have up to the present seen.

Yours faithfully, (Signed) J. H. CUNDALL, Works Manager.

BELL'S ASBESTOS BLOCKS & LUMPS FOR GAS FIRES.

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The engineer of a world-renowned firm writes:—"There is not, nor can there be, any doubt as to the excellence of your Asbestos and Indiarubber Woven Sheeting—as a jointing material it is unrivalled."

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BELL'S ASBESTOS YARN AND SOAPSTONE PACKING,

For Locomotive Engines, Cranes, &c.

The following Testimonial refers to this packing;—

Festiniog Railway, Locomotive Superintendent's Office, Portmadoc, Jan. 13th, 1883.

Mr. John Bell, 118, Southwark-street, S.E.

Dear Sir,—I have much pleasure in saying that the Asbestos Yarn and Soapstone Packing gives every satisfaction; indeed, better than we expected. We have a locomotive packed with it, and has been running five months (and think of the piston speed with our small wheels). I think the Soapstone a great improvement, as it keeps the packing elastic, and prevents it getting hard. I am very pleased with its working, and also the very low price for such good lasting packing. The Asbestos Yarn we find is very useful, and answers admirably.

(Signed) Yours truly, W. WILLIAMS.

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For Marine Engines. Every 10 feet length of the above Packings has a label attached bearing my Trade Mark, without which none is genuine. The following Testimonial refers to the Asbestos Cloth Packing:—

S.S. "Norfolk," S.W. India Docks, London, February 28th, 1882.

John Bell, Esq.

Sir,—I have great pleasure in reporting on your Asbestos Cloth Rope Packing which you sent me on trial. I tried it in one of two H.P. Piston Rods, and it ran 90 days without repacking. The other H.P. Piston Rod was packed with a similar form of packing, not composed of Asbestos, and was repacked 10 times during the 90 days. I have recommended it both at Sydney and Melbourne, and shall do my best to take this packing in whatever steamers I may have to do with.

I remain, Sir, yours truly,
W. W. PROPHET, Chief Engineer S.S. "Norfolk."

BELL'S SPECIAL LONDON-MADE ASBESTOS MILLBOARD,

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Globe Tube Works, WEDNESBURY,

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TUBES AND FITTINGS for Gas, Steam, and Water; Galvanised, Enamelled, and Hydrauli Tubes; Boiler Tubes and Fittings; Gas Fitters' Tools; Brass Cocks, &c.

ANTI-CORRODO TUBES AND FITTINGS COATED BY BARFF'S RUSTLESS PROCESS.

FOREIGN MINING AND METALLURGY.

The condition of the Belgian coal trade continues favourable. It is, indeed, astonishing to notice so much firmness, and even to have to report an upward movement in prices, while the principal clients of the Belgian colliery owners—metallurgical industry—is a prey to depression, which seems likely to disappear, but which, nevertheless, exists. However this may be industrial coal is still well maintained upon the Belgian markets, and household coal even shows an upward tendency. A statement is made and confirmed that one of the largest Belgian collieries has been compelled to purchase coal elsewhere in order to complete contracts, the stock previously accumulated being now exhausted. In the Couchant de Mons prices have been very firm for industrial coal, and an advance of 10d. per ton is also taking place in household coal. In the week ending July 29, 17,329 trucks laden with coal and coke passed over the Belgian State Railways, as compared with 16,088 trucks in the corresponding period of 1882, showing an increase of more than 5 per cent. this year. The German coal trade still continues to present a good tone, thanks to the important exports which are taking place. The movement of coal by railway is considerable, and deliveries *via* the Rhine show a large increase as compared with those which were taking place in August, 1882. Altogether a good autumn season is anticipated. The extraction of the collieries of the Ruhr during the second quarter of this year is returned at 6,620,139 tons, as compared with 5,795,595 tons in the second quarter of 1882, showing an increase of 14 per cent. this year. The deliveries effected from the basin of the Ruhr during the second quarter of this year were 6,637,992 tons, as compared with 5,825,084 tons in the corresponding quarter of 1882, so that the stock held in the basin, which stood at 170,409 tons at the commencement of April, had declined to 152,556 tons at the commencement of July. The number of workpeople engaged in the basin at the close of June this year was 96,022 tons, as compared with 87,406 tons at the close of June, 1882.

It is satisfactory to observe that the slight upward movement noticed recently in the Belgian iron trade appears likely to continue. We must, at the same time, add that the moment does not appear yet to have arrived when this upward movement can be regarded in the light of a general revival in affairs. However this may be, the principal Belgian ironworks are now well employed, and are making efforts to advance their rates. This example has not yet been followed by the small firms, which are obliged to remain a little in arrear, but it may be taken as a fact that the recent downward tendency in prices has been decidedly checked, and this is a great point gained. The receipt of a few additional orders will, probably, bring about a rise, and as these additional orders do not make their appearance the future must still be regarded as uncertain. English pig has been a little firmer upon the Belgian markets, but it has not been carried beyond 2*l.* 6s. per ton. At Charleroi casting pig has made 2*l.* 18s. per ton, and 2*l.* 8s. per ton in the Luxembourg. Very little business has, however, been concluded upon these terms. Refining pig has declined to 2*l.* 4s. per ton for hard pig; to 2*l.* per ton for ordinary pig, and to 1*l.* 16s. per ton for mixed pig. Pig of the Athus-Halanzy group has thus made an average of about 2*l.* per ton. A certain current of orders has been noted in iron, but the leading works have not a sufficient quantity of work on hand to enable them to assume a firm tone, so that they are asking 5*l.* 4s. per ton. No. 1 has made 5*l.* 2s. per ton; No. 2, 5*l.* 8s. per ton; and No. 3, 5*l.* 16s. per ton. No. 2 plates have not been carried beyond 5*l.* 16s. per ton, and No. 3 beyond 7*l.* 12s. per ton. Plates of commerce have made 9*l.* 4s. per ton. Rolling-stock is again becoming scarce on the Belgian railways, Hungary and Austria, in which the wheat crop is likely to be of exceptional abundance this year, having absorbed all available vehicles. The Foscolia, a steamer of 3500 tons, has just quitted Antwerp with a complete sugar-making plant, constructed by the Fives-Lille Company. The steamer also carries out a large quantity of railway plant and an iron warehouse, the whole having been constructed for the house of Verhaeren and De Jager, Brussels. This plant is intended to be employed upon a sugar plantation in San Domingo.

There has been no material change in the French iron trade. In Germany also the current aspect of business has scarcely varied. A slight tendency to improvement has, perhaps, appeared, but it has been so feeble that it cannot be said to have exerted any appreciable influence upon quotations. The demand for pig appears to be reviving a little in Westphalia, and intending purchasers seem to be unable to offer any further resistance to the exigencies of producers. At the same time orders are still scarce, and English competition will probably prevent any serious upward movement. The rolling-mills have been obliged to reduce their means of production in some cases. Plates have been better maintained, especially special plates, for which there has been a rather important current of orders. Steel has also been in some request, and fresh orders would be welcome, and may be said to be necessary, in order to keep the works going in a completely satisfactory fashion. The blast-furnaces of the Zollverein, produced in June this year, 275,000 tons of pig, as compared with 246,000 tons in June, 1882, showing an increase of 29,000 tons this year. In the first half of 1883 the aggregate production of the blast-furnaces was 1,670,000 tons, as compared with 1,515,000 tons in the corresponding period of 1882, showing an increase of 155,000 tons this year. A slightly better tendency has been remarked in iron at Dusseldorf, as the demand appears to be gradually increasing. Bars have been in increased demand at Dusseldorf, but boiler-plates have been weak. A contradiction has been given to a statement that the Upper Silesia rolling-mills have advanced their rates for rolled iron from 6*l.* 5s. per ton to 6*l.* 12s. 6d. per ton.

GEOLOGY, AND THE HISTORY OF ANCIENT INDIA.—No. II.

In subsequent portions of his paper Prof. Ball refers in turn to the author of the Periplus of the Erythraean Sea, Ptolonny, Arrian, and Mahomed ben Mansur, who wrote in the 13th century, and whose remarkable Persian work on Precious Stones has been translated into German and English, and from the latter Prof. Ball gives some interesting facts. Of diamonds, says Mahomed ben Mansur, seven kinds are recognised—white transparent; the pharonic; the olive-coloured, the white of which inclines to yellowish; the red; the green; the black, and the fire-coloured. In spite of this elaborate classification, Mahomed's knowledge of the *habitat* is very vague. He says:—"In the eastern parts of India is a deep ravine, inhabited by serpents, where diamonds are produced. Some people suppose that it is found in the *yakut* mines." Here there is an obvious allusion to the diamond myth—to be described hereafter. *Corundum* (Senbade), he says, quite correctly, is next in hardness to the diamond, and is of a reddish or bluish colour. The mines were situated in India, Zanzibar, Siwas, Kerman, Nubia, and Ethiopia. The best kinds were from Siwas and Nubia. Under the title of *Yakut* are included six classes: red (*i.e.* ruby); yellow (*i.e.* Oriental topaz); black (*i.e.* pleonaste); white (*i.e.* white sapphire); green (*i.e.* Oriental emerald); and blue, or smoke colour (*i.e.* sapphire). Of these classes subdivisions into varieties are given. It is certainly a most remarkable fact that at so early a period the essential identity of these precious stones—a fact only comparatively recently ascertained by chemical examination—should have been known to the Persians. The hardness and other characters are correctly stated also by Mahomed. The locality of the principal mines is stated to be the island of Saharan, which is 62 farsanges in diameter, and lies 40 farsanges behind the island of Ceylon. The *yakuts* are found there in a high mountain. This jumble is not easy to explain, the true locality being Ceylon itself, which is noted for its high mountains, culminating in Adam's Peak. Another locality is also mentioned, Tara, near Cairo, where mines were discovered A.D. 1270.

A stone, called by Mahomed the *chamahen*, should come here, if, as is stated, it is next to the diamond in hardness; but this is inconsistent with another assertion that, when rubbed on a hard stone, it colours it red. When broken it divides into branches. The most beautiful in blackish-red; it is found in the district of Karak. But for the first statement Prof. Ball would be inclined to identify this as jasper. Of spinel (laal) there are four classes—the red, yellow, violet, and green. Of the red there are eight varieties. Mahomed only mentions one mine, that in Badakshan, the capital of which, Balkh, gave origin to the term "Balas." His account, which is as follows, was unfortunately not available to me when giving a *précis* of information regarding the locality:—"At the time of the caliphate of the Abbasides, a mountain at Chatlan was rent open by an earthquake, where there was found the *laal* of Badakshan, bedded in a white stone. It is very hard to polish, and it was a long time before it could be smoothed, till it was at length accomplished by means of the gold marcasite called *ebrendshe*. Smaller stones are found in the bed round a large one, like the seeds of a pomegranate. The miners call this bed of the spinel *maal*. There were found in the mines first red then yellow *laal*, and it belongs to the kinds of the *yakut*." The discovery of these mines by a landslip finds a parallel in a recent discovery of sapphires in the Himalayas. The white stone which formed the matrix is probably limestone.

Turquoise (firuse) is obtained at Nishabar, Ghasna (? Ghuznee), Irak, Kerman, Chouresm, the first being the most valued. There is, therefore, no Indian locality: such seems to be still the case. Talc (sitarei semin = star of the earth)—two kinds—one found in the air (?superficially), and the other in mines. Mahomed says:—"Artificial pearls are made from it, and it does not burn or calcine with fire. If you dissolve it and rub the limbs with it, it makes them fire proof. Talc can neither be pounded in mortars nor broken to pieces with hammers. The way to dissolve it is to boil it with beans; to wrap it then in a piece of linen. If dissolved talc is mixed with a little resin and saffron, and used as ink, it makes a gold ink, and without saffron silver ink." Rock crystal (bellor) of two kinds are mentioned, one being clear and the other dark yellowish. The added statement that they can be melted like glass, and then coloured so as to imitate the *yakut*, *laal*, or emerald, is unintelligible since rock crystal by itself is a most infusible substance. Perhaps what is meant is that siliceous sand was used in the manufacture of the glass or paste of which false stones were made. Mahomed says that at Ghasna there were four crystal vessels, each of which could contain two skins of water. He mentions that crystals of other minerals and wood (probably crystals of tourmaline) often occurred enclosed in the *bellor*. Some fanciers, we are told, prefer the Arabian to the Indian variety.

Amethyst (dschemst) he says is of four kinds: deep rose colour and sky-blue; pale rose colour and deep azure; pale rose colour and sky-blue. It was much esteemed by the Arabs. Mahomed does not refer to its occurrence in India, but states that it was obtained near the village of Safwa, three days' journey from Medina. Wine drunk out of a goblet made of amethyst does not intoxicate, upon which Mahomed's translator remarks:—"This opinion was also current in Europe, and the name *dschem* or *dschemshid* is connected with it. The Greek word *amethustos* also means unintoxicated, but it is originally derived from *dschemest*, as the jasper from *jaschep*; hyacinth from *yakut*; emerald from *semerrud*; pearls (Margarita) from *merwarid*; turquoise from *firuse*; lapis-lazuli from *ladschwerd*; sardonyx from *sard*; talc from *talk*; chalk from *kals*." Of emerald (semerrud) seven varieties or different shades are recognised. The mine was situated on the border of Negroland, in Egyptian territory. The matrix of the gem was talc and red earth. It seems probable that this was the source of the emeralds which went to India, and also supplied the Greeks and Romans. A soap green emerald was also found at Hedshas, in Arabia.

Owing to the fact that jade was not recognised as a distinct mineral until introduced into Europe from the New World, the older writers sometimes, on account of its hardness and transparency, spoke of it as emerald, while others applied to it the term jasper. There can be no doubt that jade is meant by the following, not jasper as his translator has it:—Of jaschep or nussr there are five kinds: white and light; whitish yellow; black-green; transparent black; dust colour. Mahomed adds that in China they make false jaschep which is distinguished by its smoky smell, and that there are two mines in China called respectively Ak-Kash which produces light, and Kut-Kash which produces dark jaschep. It is found on the frontiers of Kashgar, Kerman, and Arabia. Kash is the name for jade current in Eastern Turkistan, and *su* or *zu* is the name by which it is known to the Chinese, who esteem it more highly than do the people of any other nation. Chrysolite (? shebershed) is said by Mahomed to be obtained in the same mine as the emerald, of which it is a variety according to some authorities. If so it cannot be what is now known as chrysolite, which is the transparent variety of olivine.

Mahomed mentions a number of other minerals, among them several ores. Of the magnet he says there are four kinds—the iron, gold, silver, and tin which attract these metals respectively; possibly by this it is meant to be conveyed that ores ascertained to contain these metals exhibited magnetic properties. The statements regarding the knowledge possessed by the Persians of the relative specific gravities of some precious stones are of interest:—"Abu Rihan is said to have found by experiment that a muskal (=1½ drachm) of blue *yakut* (sapphire) is equal to five dank and a tissu of red *yakut* (ruby), or to five dank and two-and-a-half tissu of *laal* (spinel), and that four dank, minus a tissu of coral, are equal in size to four dank, minus two tissu of onyx and crystal. The mode of discovering the size and weight is the following:—A vessel is filled with water, and the stones thrown singly into the water; the quantity of water which is expelled from the vessel by means of each stone is equal to the room it occupies."

A notable authority on the mineral production of India during this same 13th century is the famous Venetian traveller, Marco Polo. In reference to the diamond, he states that it was only obtained in the kingdom of Mutfili—probably Motupalle—a still existing port in the Guntur district of Madras. He describes three methods as being followed in the search for diamonds:—1. After the rains the beds of torrents from the mountains were searched; these localities were infested with venomous snakes. 2. Pieces of meat were thrown down from the tops of mountains into inaccessible valleys; these pieces of meat were pounced upon and carried up to the tops of mountains by white eagles, and when recovered diamonds were found sticking to them. This story, made familiar to all by the travels of Sindbad the Sailor, is one of great antiquity. The earliest mention of it, according to Colonel Yule, is by St. Epiphanius, Bishop of Salamis, in Cyprus, who, in the fourth century, wrote a treatise on the twelve jewels in the breastplate of the High Priest. The tale, as told by him, however, refers to the jacinth, not to the diamond. The third method may be described as a corollary of the second, consisted in searching the birds' droppings and intestines for diamonds which they had swallowed with the meat. The next authority is the Indian historian, Ferishta, who wrote in 1425, who refers to now long-deserted diamond mines in the Central Provinces of India, which Prof. Ball has been able to identify as having been situated at Wairagarh, in the Central Provinces. The last writer of what may be called the fabulous period, which closed with the 15th century—at least in so far as regards the diamond fable—was the Venetian, Nicolo Contai, an account of whose voyage is given by Baptista Ramusio in his book of Voyages and Travels, on the authority of Messer Pogio, Fiorentino. After mentioning the collection of the diamonds with the meat he describes a different process, which is simply that of washing for diamonds in the beds of rivers. For as far back as we have any certain knowledge of them the diamond miners have all belonged to one or other of the non-Aryan or aboriginal tribes, who regard the mines as being the special property of the blood-thirsty goddess, Lakshmi, whose cruel nature requires much propitiation. To this day sacrificial offerings are made to her on the opening up of mines, of whatever sort, and occassionally the meat is placed on an altar-like scaffold; and in India, as a matter of course, vultures and kites, with other raptorial birds, would carry away and devour whatever portions of meat they could seize upon. Out of this custom it seems to Prof. Ball most probable that the tradition grew which has now attained to such a respectable antiquity. Lookers-on, unacquainted with the semi-savage rites, regard them as essential parts of the search for diamonds.

In the year 1503, Lewes Uertomannus, who is described as a Roman gentleman, travelled in Western and Southern India. The account of his travels contains some interesting particulars bearing on our present subject. Of Cambaia he says (p. 381):—"In this region is also a mountaine where the onyx stone, commonly called corneola, is founde, and not far from thence also another mountaine where the calcedony and diamant are founde." At the same time a doubt must be expressed as to true diamonds having been ever found there. Further on our author says: "Sixe miles from the city of Decan (?Bisnagar) is a mountaine where diamonds are digged. It is compassed with a wall and kept with a garrison."

[*To be continued in next week's Journal.*]

Original Correspondence.

COPPER AND COPPER MINING IN THE UNITED STATES.

Sir,—In the interesting letter from "J. D.," published in the *Mining Journal* of July 28, on this subject, reference is made to the mines of the Butte district in Montana, but says he is ignorant of their capacity, and consequently of the effect their output may have on prices. As I am well acquainted with the mines of Butte I can give some particulars which may be of interest to your readers. During the last 12 months Butte has produced in round numbers about 7000 tons of copper. The largest producer was the Colusa Mine, owned by the Montana Copper Company. During the 11 months ending June 30, the returns of which are before me, this company has shipped 6,841,990 lbs. of copper, associated with 238,000 ozs. of silver. The mine is opened to a depth of 260 ft., and has reserves in sight above that level sufficient to sustain the present output for five years. The company is steadily enlarging its smelters, and adding greatly to its production. The Anaconda Company, which has developed large bodies of ore, is also erecting smelters, which will be working probably by the beginning of the year. Other mines are also increasing their output.

From all these sources I think I am justified in expecting an additional production in Butte district for the year 1884 of 8000 to 12,000 tons of copper. This estimate, I may remark, is not based on the sanguine hopes of mineowners, but on actual reserves of ore exposed and measurable, and requiring only the smelting facilities, which are now being supplied. If this be all the additional supply to be expected in the United States, and I hear of no other new sources at present, it will probably be to a great extent absorbed in America, and not affect European prices. The effect of the recent over-production has been to bring prices in America to the European level, virtually abolishing the protective duty, and cheapening copper to the consumer by 20 to 25 per cent. With this impetus to enlarged consumption, and the naturally increasing demand of a community progressing so rapidly as the United States, there ought not to be much difficulty in absorbing an increased yield of 8000 to 12,000 tons. The lowered price, too, will have the effect of diminishing the production from the less profitable mines.

That future development in the Butte Mines, which are powerful fissure veins in granite, will justify the erection of still larger reduction-works than those now in contemplation, and consequently lead eventually to a much larger production, I have no doubt, but at present perhaps it is sufficient to state what may be expected for the year 1884.

Late advices show a much firmer tendency in the American copper market, and the demand for regulus and furnace material specially show strength. This is said to be due partly to the great falling off in the product of the Arizona mines, many of which have not turned out as expected, and partly to the closing of some of the smaller mines owing to the fall in prices.—*London, Aug.* 6. T. A. B.

AMERICAN v. BRITISH MACHINERY.

Sir,—A statement in the *Mining Journal*—"Much has been heard of late of the superiority of mining machinery made in America, as compared with that manufactured in this country, but from all that can be ascertained from careful investigation, this claim of American superiority is entirely unsupported, and not only so, but many of the American machines are mechanically wrong in construction, and certainly wanting in strength and solidity as compared with those made in this country"—has been taken up rather warmly by one of the smaller San Francisco newspapers, the writer in which states that he could give facts innumerable in refutation of this wholesale libel upon a triumphant industry, but will content himself with a few, which he commends to careful consideration.

Taking his refutations in their proper order, he says that, firstly, with the exception of the coal and a few copper and tin mines, the "right little, tight little, isle of the sea" offers a comparatively barren field for the invention or introduction of mining machinery. For this reason the inventive genius of British mechanics has been directed towards other and more promising avenues for their skill. Second, as a consequence, while much, perhaps most, of the machinery invented and manufactured in England may claim superiority for the purposes for which it is designed, ignorance of the methods of and needs for extracting and reducing the precious metals would preclude the possibility of the successful construction of appliances for this purpose. Third, it is safe to say that not one in a hundred among British mechanics has ever seen the inside of a mine, and consequently little or nothing is known practically of the characteristics of ores or the varied forms in which they are found, and still less of the methods best adapted for their extraction. And fourth, the indubitable fact that the best made, most satisfactory in results, most economical, and most solid and enduring machinery for mining purposes in use to-day is that invented by practical American miners, and built in American shops. In support of the latter statement we say that nine-tenths of all machinery purchased by English capitalists for use on their mining properties in America is of American invention, constructed in American shops.

The San Francisco authority very truly remarks that it should be remembered that nearly every machine for mining purposes now in successful operation in the United States, as well as in several of the British provinces and in South America, &c., is the invention of men who have had in many instances a dearly-bought experience in American gold, silver, and copper mines. That these machines were mostly constructed by mechanics who have at some time worked in mines and metals, and who have been trained to the construction of this special class of machinery in shops specially devoted to this kind of manufacture. Some mistakes have been made, and it is true that many failures are recorded against some forms of mining machinery. But investigation proves that these have occurred through the ignorance of those entrusted with the purchase of a style of machine not at all adapted to the working of the particular class of ores upon which the plant was placed.

The writer then goes on to remark that in San Francisco particularly there are to be found many foundries and machine shops which have been built up and now enjoy a prosperous trade under the fostering influence of the mining industry. In these shops are employed large numbers of men, skilled, as we have said, in the construction of machines for the extraction and reduction of ores bearing the more precious metals. In these shops has been built most of the machinery now in use in the mines of the West. Most of this machinery has withstood the test of time and the base and rebellious ores it was designed to operate upon, and through its effectiveness American mines have yielded many hundreds of millions of dollars during the past 34 years, and so the material wealth of the world has been correspondingly augmented. How much has English machinery contributed towards this end? There is probably not a single mining property in the country which is worked either in whole or in part by machinery constructed in English shops. The wonderful development of the mining interests of the world is due almost entirely to the effective, strong, and solid mining machinery invented by American mining men, built by American mechanics, and managed by American workmen.

Of course, it would not be difficult to prove that many of the American machines are wrong in principle, and perhaps the reason that American machinery, taken as a whole, is less appreciated than it should be by Englishmen, is that Americans who invent anything worth the attention of their countrymen at home never trouble themselves to go to Europe to sell it, seeing how much larger and better field America offers. Whenever you see an American peddling his wares in Europe you may be sure that he is a man of no account—that is to say, a man of little brains and less principle. London, Paris, and the Hague abounds with these unmitigated loafers, and it is they who give to Englishmen a bad impression of Americans and American inventions.—*State-street, New York, July* 12. P.

MINING PROGRESS IN QUEENSLAN

Sir,—The districts which have been to any extent developed continue to yield results as satisfactory as those already reported, and in the new localities prospects are decidedly brightening. For example, the Herberton Advertiser of May 26 states that some activity in mining matters may be shortly expected, as a large number of the claims which have been registered as exempted from work for various causes in the vicinity of Herberton will be resumed at the end of this month and the beginning of the ensuing one. The St. Patrick claim at Herberton has been raising for some time back good quantities of the usual high percentage ore, which is now being carted to the Co-operative Company's machine. At the Co-operative Company's mill there is now a fair quantity of stone in the yard. Crushing was resumed on yesterday week, and upon a recent visit it was found to be working most satisfactorily. The Syndicate stone was then going through, which appears to be turning out fairly well.

The Great Northern Prospecting claim at Herberton is offering great encouragement to those concerned. From this grand property large quantities of splendid ore are now being raised at the several shafts. At No. 1 or gully lode the work being carried on is driving levels at the 120 ft., and the stone in the faces at this depth is showing a very large body of ore of first-class character, and an improvement on any that has hitherto been obtained. This is characteristic of the lode, as it has always improved as depth has been attained. Good ore is also being raised from the stopes at a higher level in this shaft. There are between 400 and 500 tons of ore from this property now in Herberton Tin Company's machine yard. Carting from the paddocks to the machine continues daily, and there is no perceptible diminution at the heap. Crushing this ore day and night has been going on for some time, and from the present prospects is likely to continue for an indefinite period. Thirty men are employed on this property, and at no time since the first opening up of these lodes have they ever looked better than they do at present. The No. 1 or gully shaft is the lowest level of any claim on this field, and the ore at the bottom is the best the claim has ever produced, being what is known as bagging ore, clearly showing the permanency of the lodes of this field, and that as depth is attained greater riches await the miner. This fact should tend to cheer up the flagging hope of many here who are still prospecting the claims they hold. The engine for pumping and winding is expected at an early day.

The North Australian Mine, between Herberton and Watsonville, has become famous for the large quantities of rich ore it has produced since it was first opened up, and the same result is still going on, for large quantities are now being brought to the surface of even a richer character than before. As to the quality of the Herberton stone there can be no question, for at the co-operative machine the Syndicate stone 124 tons 12 cwts. 3 qrs. 24 lbs. has passed through, giving a yield of 31 tons 8 cwts. 2 qrs. 14 lbs. black tin gross. From the Christmas claim, Emu Creek, 4 tons 4 cwts. have been put through during the week, yielding 16 cwts. 2 qrs. 11 lbs. St. Patrick ore, 77 tons 7 cwts., is now finished, and the yield though not weighed, will be at least 26 tons of black tin. St. Andrew, a small trial parcel from this claim is now passing through. The North Star claim is adjoining the New Zealand lease, Herberton, and owned by Walsh, Casey, and Bethel, who have been prospecting their property since taking it up, by sinking and driving, and the indications of soon cutting the lode are daily presenting themselves, thereby raising the hopes of the owners. The Southern Cross property, Hayes and party, is now carting a quantity of ore to the two mills, which is expected to give good returns. It is a monster lode, and would be superfluous to comment on it. Its reputation is well known on the field. It is real good property.

But it must not be supposed that tin is the only metal which Queensland is capable of producing, and with very little more development lead and silver will acquire equal importance. At the Silver Camp the miners are fully employed, and all hands are cheerful at the prospects before them. The Silver Valley Mine is looking splendid; 10 men are kept busy raising a quantity of ore. Captain Goodfellow, the manager, has a magnificent specimen from this mine, showing the pure silver on the matrix as if it were the frosted work of the silversmith. At this portion of the district mining affairs look bright, and the holders of claims are jubilant at the prospects before them. The Caledonia, the Target, the Limestone, and other claims are showing huge lodes of galena; the last named is looking remarkably well, and is highly spoken of among the mining folks. A large number of claims have been taken up within the past six weeks, and a considerable population is now permanently settled down, looking forward to the day when they will be recognised as the "Silver Kings" of Northern Queensland.

Turning to gold and the Gympie district the information to hand states that No. 1 North Phœnix have crushed 1062 tons of stone for a yield of 1111 ozs. of gold, and a dividend of 1s. 6d. per share has been declared. In the Golden Crown Mine specimens have been obtained containing 150 ozs. of gold. The total crushings for the week were:—310 tons of stone from the United Smithfield yielded 475 ozs. 1 dwt. 12 grs. smelted gold; 1062 tons from No. 1 North Phœnix, crushed at the Gympie, Maori, and the company's own batteries during the past three weeks, gave a return of 1111 ozs. 9 dwts. retorted gold; 618 tons from the Phœnix p.c., raised from the mine and crushed during the past three weeks, 532 ozs. 12 grs. smelted gold; 190½ tons from Nos. 3 and 4 North Glanmire, 197 ozs. 15 dwts. retorted gold. The public mills are now engaged on stone from the Golden Crown, Nicholls' lease, No. 1 North Phœnix, Nos. 3 and 4 Glanmire, Nos. 2 and 3 Smithfield, and No. 1 North Glanmire. The crushings for the week ended May 11, which had been cleaned up, were:—No. 1 North

Glanmire, 131 tons, 284 ozs. gold; Nos. 2 and 3 Smithfield, 154 tons, 132 ozs. gold; Golden Crown, 286 tons, 661 ozs. gold. The latter company have declared a dividend of 1s. 8d. per share.

At Lucknow, in New South Wales, a wonderful yield is reported by the Western Advocate, which states that on Nov. 16 a bonanza weighing 22 cwts., taken from the New Reform Gold Mining Company's Mine, was shipped by the Potosi, which the manager estimated at 150*l.* This stone possessed some peculiarities not previously noticed. It was of a dark blue colour, the gold in it being remarkably fine, whilst an absence of pyrites was noticeable. On May 9 Mr. Newman received a cablegram giving the returns of this shipment at 1110*l.*, or at the rate of about 250 ozs. to the ton. Since the mine was started under the new *régime* returns amounting to 3329*l.* 8s. 4d. have been received; about 1500*l.* worth of stone is on hand, and shipments on the water bring the amount up to 5000*l.* N. B.

Brisbane, June 1.

MINING ENTERPRISE IN BRAZIL.

Sir,—I have spent considerable time since I last wrote in travelling about this centre. The mineiros are doing more prospecting work, and they seem quite roused up. Working in quartz or below the water-line has not suited them, and most of their efforts have been confined to river washing when streams were low, and to scratching in jacotinga. The French Syndicate are getting on very well apparently. At the Raposos Mines in the first adit the canal shoot has been cut, and the ore found to be worth 6 oits. in the mill. The pay ore, which at the bottom of Canal shaft was 16 ft. on the course of the lode, runs 36 ft. in the adit, all fine compact pyritic stuff; and the little 4-stamp prospecting mill took out 1500 oits. during the months of May, June, and July. Twelve additional heads of stamps will be ready for work soon, and the sand will be subjected to re-treatment.

The property Morro Esperito Santo, lying between Raposos and Morro Velho, and joining both, has been purchased by this syndicate. This property has a very large mineral lode running through it, and by some experts it is thought to be the extension of the Morro Velho lode. The lode is traced by ancient workings some 2000 ft. on its course, and the recent exploitations by the syndicate have proved a vein of 10 to 20 ft. wide, worth from 2½ to 4½ oits. gold per ton at no great depth. Passagem Mine, same proprietors, goes on as usual. Extensive works are pushed ahead in the mine, while a 12-stamp mill pays all expenses of opening new ground, and building, &c. The Repucha or Borgas Mine is waiting for a pump, meantime a new canal, and a mill with some houses are in course of construction. You will hear more of these mines in six months' time. Morro Velho I hear nothing new; very large quantities of new machinery are being delivered, and carpenters are in request; the produce continues low. Cuiaba has the finest mill in all the Brazil; but that is poor consolation for stockholders, who do better with less machinery and less cost. The late Mr. Morrison, when manager, strongly urged the company to open and prove the mine before putting up this machinery. Mr. Dale has (by the courtesy of the French Syndicate, as theatre managers would say) made an examination and report on Cuiaba for the company. The syndicate were not asked in reference to the matter, but the omission was for this time I am told overlooked. I think that the new manager, Mr. Oldham, is doing all he can for the good of the company. Of course he cannot control the London management, and he should not be blamed if they make any mistakes, which if they do not I shall think that they have been born again.

Mr. Morris, ex-Californian and the tailings expert, has, I hear, entire charge of the reduction department. We shall watch progress in this intricate business with interest. Mr. Morris has introduced four-wheeled carriages of the style known in California as "buck-board," and he has made a pilgrimage to Cuiaba in one. These old Californians have wonderful powers of endurance. There is probably no place in the world where such work as Mr. Morris undertakes as his speciality better situated, with its large accumulation of tailings and abundant water, than Morro Velho. I and all who are at all interested in mining wish him success.

Pari I can only speak of from hearsay and from reports in your Journal. The printed reports are at any rate curious. Pitangui is about done up, and workmen dispersing; there are still some officers left at the mine, Descuberto, or the Brazilian Gold Mines, with their "pounds of gold in the safe" (so I see by report in the *Mining Journal*) still dragging on, but with no better prospects. Don Pedro at Morro St. Anna waiting, hopeful, and prayerful, looking to London for help. It is to be hoped that no patchwork will be done if a new company is formed. If money enough cannot be raised to pay off all debts and leave some 30,000*l.*—at least that sum—for re-opening the mine and repairing the works it better be let alone. A flying visit to Morro St. Vincento was made by some Londoners, who it is said in Ouro Preto stated that they were about buying a full lease of some dozen or more Brazilian mining properties, and they particularly wanted our mine, situated within three hours' ride of Ouro Preto, where they were staying; they would not take a day to visit it, for they knew all about it, yet not having seen it. They wanted at once a procuration that they might return to London, sell it, and remit the money within three months' time; they take the procuration. I think that I understand the farce, having learned who was one of the party. Plenty of room here for capital, and well directed efforts will bring about good results. Minas.

St. Joao do Morro Grande, July 9.

ST. JOHN DEL REY, AND ITS PROSPECTS.

Sir,—I feel that I must reply to "Facts" letter in the Journal of June 2, which I have only just now seen. I disclaimed any intention of giving the St. John del Rey Company a sly stab. Of course facts about the condition of the mine which the London managers kept entirely from the public, while they led the public to believe that, as Mr. Tendron said, the Morro Velho Mine was magnificent, and that Cuiaba was a grand affair, as Mr. Schofield intimated and worth to him 100,000*l.* (I think I am right in this statement.) Of course I admit that the publication of these facts was a stab, but I did not make sly stabs.

I am not interested to the extent of one penny either as "bull," "bear," or holder of the St. John del Rey stock. I declined the advice of "Vigilance" to buy the stock when the price was 160, and I decline the advice of "Facts" to buy at present price. If I as well as "Investigator" had been driving my own wheelbarrow, the opinion of every mining man in the city must be that I had the easier time of it, as my wheelbarrow has had only to run down hill. Mr. "Facts" says "he has a thorough knowledge of the Morro Velho Mine." I cannot admit that as fact; I do think that he has. He follows out the old course, the story that I should think was quite played out in London — *i.e.*, that a mine if it has given enormous profits, if a very large quantity of gold has been taken out of it it must continue to yield largely, as a railway may continue to earn money. He ignores the fact that a mine can be worked out or cease to be profitable in depth, and in the usual style he pitches into the management when dividends cease. He hits Messrs. Hockin and Tendron very hard when he says that they and their fellow managers have done the shareholders out of 2,000,000*l.* sterling by improper management. I think that they should now forgive all that I have said, and go after this fresh man. "Facts" shows ignorance of the subject on which he writes. All who know Morro Velho Mine or who have read the reports of the mine captains engaged in working it have been aware that the rich mineral has been narrowing as depth was attained. Mr. Dale advised of it before he left the mine to go to Cuiaba. Professor Mills told the company that they were working on an inverted cone. Certainly the results, the earnings, the dividends tell the tale. Outside the rich pay mineral the yield per ton does not approach what "Facts" states as fact. The average barely reaches 36 per ton, or 25s. with the mixture of the best ore the mine contains. I dispute "Facts" indisputable statements. I am not doing injustice to *bonâ fide* mining. The Morro Velho Mine has been worked a long term of years. It has given large produce, large profits, large salaries, large gains on slave labour, slave contracts also, which have given rise to painful remark. The ore in the mine is failing, or there is large stealing somewhere. You cannot have your pudding and eat it too; I think it has been eaten.

My letters have not been meaningless, as the managers of the St. John del Rey Company well know. They attacked me for commenting on what they knew at the time was the truth respecting the mine, and you all now know it was truth. The attack led me to keep well posted on the conditon of the mine, and as far as possible on the management, and I quite agree with "Facts" that a change in the London management is desirable, and may keep longer life in the mine. With the reports and advice of their mine superintendents before them they have often, and especially in regard to Cuiaba, acted directly contrary to such advice. Notably when Mr. Morrison urged that no more machinery be put up at Cuiaba, as the mine was not prospected. At the same meeting when this report and advice was read it was resolved to push ahead and put up more costly machinery. The St. John del Rey Company's mines have been worked in London by managers who either did not know or did not care about what would result from their policy. I do not think that they knew the business, and I think that more than half the disasters in foreign mining are due to the management of London directors. But if gold is not found in paying quantity no mine can flourish. I have never intimated that Morro Velho should be abandoned. Indeed I have said that some more moderate dividends might be expected, but "Investigator's" celebrated letter, "The King of Gold Mines," with his wild baseless, even ridiculous, ideas on dividends, price of shares, &c. "Investigator," who sometimes speaks at the company's meetings (I think that I am right) I certainly feel that I had a right to say all that I have said in reply to that letter. I have not, as Mr. "Facts" claims to have, a full knowledge of the Morro Velho Mine, but I do not speak at random. I was charged with publishing false information when the stock stood at 260; a couple of 5 per cent. dividends have since been paid. We who are interested in mining will watch the course of events, and see later on who at this date was right. Investigated.

POTOSI MINE.

Sir,—The telegram just received from this mine is another of those examples of the long delays experienced in getting news from gold mines. It would have been thought that we had had enough of this sort of business over the Indian mines. It is to be hoped that the tactics of Indian jugglers is not being copied by the representatives of Venezuela mining. We had delays and excuses for them well mixed, with what results we all know. Under date of June 8 the manager says, that the boilers and crushers had actually arrived at the mines, and that the balance of the machinery necessary to complete the mills was within six miles of the mill-site. June 21 the manager writes:—"I now feel sure engine beds will be at work in four days (June 25). The mill will be started as soon as engine can be put together." A few days thereafter (June 25) we should have received the news which is only now to hand; so that more than a month has been wasted, or we now know what should have been known a month ago. It is desirable that the results of the crushings should be made known as early as possible. We are approaching the time of the shareholders' meeting. Is it possible that things are growing up to the grand climax of a paltry return, and apologies for being shorter than ever of capital? During the past ten days the value of the shares has been increased by 100,000*l.*, on the long delayed information of the stamps going to work. "The more powerful engine which is about being shipped," when the prospectus came out, was calculated to "produce 3000 ozs. of gold per month by the present mill." With monthly expenses, then at 4500*l.*, it was stated that "the dividend-paying power" was over 18 per cent. The "dividend-paying power," after a trial of over two and a-half years, has proved *nil.* Instead of earning 18 per cent., it would be satisfactory to know what percentage of loss has been made.

Austin Friars, Aug. 9. Observer.

POTOSI GOLD MINE.

Sir,—Since writing you last week the long-expected telegram announcing the recommencement of crushing operations has come to hand. But once more the long-suffering shareholders are doomed to disappointment. Instead of actual results we have only another miserable statement evidently sent to keep us quiet a little longer. The telegram referred to reads—"All works on Chile lode at Peru running at full swing; 30 stamps running." I would ask any of your readers who may be interested to compare with the above the following extract from the *Mining Journal* of April 21:—"The directors have received a telegram from the mines—'Cut Chile lode at Peru; 100 tons out, 3 ozs.; ore inexhaustible; stoping full supply mill.' The directors this evening write—'It is with pleasure we have to announce the safe arrival at Cuidad, Bolivia, on March 15, of the Auiba, conveying the balance of the new machinery from New York, which has relieved them of a great anxiety. As there will be no difficulty in procuring conveyances to transport this machinery up the country to the mines, the directors consider there is every reason to believe the mill at Peru will be ready to commence crushing by the end of May or the beginning of June.'"

We are now well on for the middle of August, and the stamps have just been set to work, with what results time only will show. Seeing what fair promises have been made from November, 1880, the swagger about Peru is not calculated to inspire much hope.

Austin Friars, Aug. 9. G. H. J.

TOCOPILLA COPPER MINING AND SMELTING COMPANY.

Sir,—Knowing that our much respected Mr. Tredinnick is still under Dr. Cooper's care at the British Naval Hospital, Valparaiso, and has not been allowed to see any papers for some time through illness, we could not allow the letter sent by a discreet and prudent "Observer" of Tocopilla to the *Mining Journal* of March 3 to go unanswered. I believe that the public in general, and more particularly the intelligent readers of your Journal, have nothing but repugnance and disdain for such worthless denouncements. But, owing to the great distance, it will require a long time before an answer can reach England, and in the meantime there might possibly be some persons who would give credence to the perfidious statements made by "Observer." Oh! if the public only knew the individual who had the sagacity not to write his name, it would be sufficient information to prove to what degree of confidence he ought to aspire.

Constant and unsuccessful candidate for the post of manager of the Bella Vista establishment, he is continually evincing his *aigreur bélieuse*, to which he has given vent through the medium of the Journal. He has never been able to pardon the Tocopilla Copper Mining and Smelting Company for having chosen any other than himself. This is the simple reason of his virulent attacks on the present manager. And although an Englishmen he does not possess sufficient knowledge of his mother tongue even to speak or write it correctly, and had to depend on another gentleman to write the prose which he considered, perhaps, interesting and beneficient to the public. Now, let us go to the question. We understand it is neither the moment nor the place to refute the lucubrations of an anonymous letter. "Observer" states the affairs are disappointing to the shareholders. There are none so deaf as those who will not hear, nor none so blind as those who will not see, especially when it is malevolence that rules the passion so much as to darken the judgment, which becomes impartial at the moment it is given to sentiments of perversity.

Who is not aware of the great inconveniences at present weighing so heavily on the Tocopilla Copper Mining and Smelting Company, and the cause of them originating at the time of the former management. On Mr. Tredinnick's first visit here he gave certain directions for work to the manager of Messrs. Jose, Odgers, and Co., which should be executed without delay at the Carmelita Mine, in order to prevent its inevitable ruin. This work was accordingly commenced during his short stay; but, unfortunately for the present company, it was immediately suspended on his return to Europe. They fell back to their own defective proceedings, and even worse. Not contented with disobeying Mr. Tredinnick's instructions, Messrs. Jose, Odgers, and Co.'s manager gave written orders to the mine agents to occupy themselves exclusively in taking away the ore, &c., and to suspend all other work. All they require was copper ore, and as the property was already sold to the new company everything was left to go in a most disgraceful and disastrous condition up to the time that the present manager took charge. That is the plain truth During Mr. Tredinnick's absence (12 months) everything was done to ruin Carmelita Mine, which for reason of its condition and exceptional formation requires great perseverance and constant care to keep it abroad. The prudent instructions given by Mr. Tredinnick were disregarded, and on his return from England he saw at once the enormous disaster occasioned by negligence. It is these difficulties, occasioned by flagrant disobedience, with which the Tocopilla Copper Mining and Smelting Company have had to contend with.

Who is responsible for all this? The readers of the *Mining Journal* well know now the truth of what has been doing hitherto. It has been repairing neglected work, pushing on vigorously important works left sadly in arrear, and remedying the ruinous condition of the mines, which cannot be accomplished in a day, for it is a question of time and money. That is the simple reason why there has not been that activity in the establishments, but as soon as these difficulties are overcome, and the company continue to work all their valuable mining property under the present improved system of management, success awaits them, malgré the contrary wishes, persons so little possessed of the ability to manage, or even criticise the management of mines, although they have had the presumption to attempt both.—*Tocopilla, June* 19. Fair Play.

NOUVEAU MONDE.

Sir,—I see in last week's Journal that one of your readers is desirous of getting some information about this mine because he has been advised to buy the shares. I would suggest to "Enquirer" that he should first ask the kind friend who gave him advice what it was upon, and also advise everybody else to ask the same question. I will take the questions in order, and endeavour to answer them. 1. According to "Enquirer's" own showing it must be 400,000*l.* If the shares are numbered up to 400,000 and the shares are 1*l.* each the amount of capital is plain. 2. A close perusal of the different reports of the company will at once show the property possessed and the property not possessed. 3. The *gerant* is the Chairman of the company; the enquiry about the relations of the *gerant* in Venezuela is a purely personal affair. 6. Quite true. 7. If "Enquirer" will get the loan of the last balance-sheet he will be able to see for himself. 8. No dividends have been made. 9. There is no further liability. If "Enquirer" will take advice he will have nothing to do with the shares lest, like many others, he finds himself "in" at the top of the market. These shares have been rigged again and again with same results, disappointment and chagrin to those who have been induced to buy at high prices. Some companies manage to muddle along somehow, and from the mystery surrounding them they have proved to be fine sport for clique after clique; whether this has been the case with Nouveau Monde I must leave your correspondent to judge. I believe that had this been any English company it would long ago have been in the limbo of forgotten enterprise. From California to Venezuela was a fine leap, and it would appear that it has been "out of the frying pan into the fire."

City, Aug. 8. T. O. R.

AKANKOO GOLD COMPANY.

Sir,—I was allowed a peep at Mr. Gowans' report on this mine, which dealt in superlatives when treating of the surface works, and did not even damn with faint praise the mining operations, but, wherever touched upon, suggested alterations; so far so good. Now, for some kind friend to do the like for Mr. Gowans and teach how to extract the gold from the hard amalgam in a short summer's afternoon and ship it to England—yea, verily, to the Clydesdale Bank, to cheer the drooping spirits of the desponding shareholders of his company. I have now been favoured with a view of the directors' report to the Akankoo shareholders of Aug. 1, which is a mere denial from beginning to end of a report sent in by me to the directors on my return from the coast. If, Sir, shareholders will now turn the report about once more and read all that Mr. Lane, the manager, and Captain Martin states in their contrary sense, they will be very near the mark. Capt. Martin is a stranger to me; Mr. Lane is not. I had a tolerably good demonstration at his hands how not to do it, in a mining sense; and, as Capt. Martin agrees with Mr. Lane, although he is a stranger to me, I would not be backward in forming an opinion of his skill, notwithstanding his 22 years' experience. I take flat exception as to the 50 tons of quartz already at grass, and am curious to hear the result of the assay assaying the mineral sent home. There is plenty of gold if they knew where to find it. I regret I cannot stay longer in England to meet the shareholders and expose this immense air-bubble. The mine, I repeat once more, is thoroughly good, but El Callao itself would not, and could not, pay under such management both as here and on the coast. I trust the shareholders will peruse my report to the board. I propose sending my views on the report of Mr. Gowans before my return, very shortly, to the neighbourhood of this ill-fated mine. In conclusion, I am certain that, from the state the manager reports, he found the reef when cut, when the assay of the stuff sent home becomes known, no further proof will be required to establish the assaying and mining knowledge of the manager and Capt. Jonathan Martin.—*Ealing, Aug.* 7. James B. Ross.

BRITISH ENTERPRISE IN VENEZUELA.

Sir,—I have observed in one of the European papers of recent date a statement that New and West Callao are so called to induce people to believe that the Callao vein runs through them, and that these lands are but little known here except that they are good for cattle and have no mines. Such statements can only have been made by an interested person, possibly with the idea of landing the Chile property; but they may, perhaps, cause a doubt in the minds of one or two of the shareholders in these two companies as to the value of their property.

It is evident that the writer of the above absurd statement cannot have read the reports on these mines, where it distinctly says they are not on the Callao district at all, but on one which may prove equally if not more rich in gold veins, and no person reading them could ever suppose that they were christened "New and West Callao" with any such delusive idea. Next it is also equally evident that the writer knows nothing whatever of the district beyond the fact that Erica is well known as a cattle station. Perhaps as a disinterested shareholder in both companies a few words as to what I have seen, not heard, may not only calm any apprehensions, but induce all the shareholders to increase their holdings while they have the opportunity of so doing at par.

I have often visited the New Callao, both last year and this, and by the courtesy of Mr. Skertchly I was shown over the property. The remarks made to me by that gentleman clearly prove that he is a master of his profession, and one of the very few men we have here who know what they are about. The Robotham lode is not yet being operated on, as the pump is not yet erected, but the small quantity of quartz Mr. Skertchly had so much difficulty in getting out is of a splendid character, and such as always carries gold in this country. The fine outcrops of the Penelli, Alfred, Emily, Mercedes, and other lodes, are really startling, and had I not seen them and examined them closely under Mr. Skertchly's chaperonage, I should, perhaps, have thought that the long bow had been drawn here. The lodes, however, are true quartz fissure veins, and are of precisely the character of veins which have proved so rich in the Caratal. Besides these veins, Mr. Skertchly has since discovered two others—the Smith and Warner veins—so that the company possess an almost inexhaustible supply of rich ore; in fact, the whole property is more or less a huge mass of quartz veins. I have lived all my life in Venezuela, and well know a gold-bearing quartz when I see it.

The timber there is splendid both in size and quantity and the Quebrada will abundantly supply a mill. Knowing what I did about the property I never thought that the late petition would stand a moment's investigation. The loss that absurd act on the part of a shareholder has cost the company untold time, money, and credit. Now I cannot imagine why, when having escaped the whirlwind of the petition, the shareholders are so backward with their help. If

the mine could be exhibited in Hyde Park they would rush to pour in their thousands. I feel as sure of a good dividend on my money as if I already had it; especially as the property is still under Mr. Skertchly's able administration. He assures me that if funds are provided to enable him to keep going till the mill is up and ore at bank he will soon put the New Callao far up on the Dividend-list, for our capital is so small that but a small gross profit will pay a large dividend. Do not then let us desert the ship. We have pumped her dry, and we now will willingly pay for repairs to stop the leak. I do not believe there is a better property in Venezuela, though there are many which are making more noise. Besides this the enterprise of the discoverer has raised the envy of others who, though they had the means, had not the pluck to develope the resources of the country.—*Cuidad Bolivar, July* 12. D. A.

CHONTALES COMPANY.

Sir,—Some time ago an interesting letter appeared in the *Mining Journal* from Mr. James Ross, of Manchester. The late returns of gold from the Consuelo Mine certainly bear out the opinion expressed by that gentleman in his letter, "that though some of the mines held by the company might not be rich, others were undoubtedly as good as the average of gold mines anywhere;" giving also the opinion of Capt. Francis, formerly manager of the Gongo Soco gold mines in Brazil. In reference to the Consuelo Mine he said—"I have worked at the St. John del Rey and at the Cata Branca Mines in Brazil, but I never saw any thing like this mine for its richness in all my travels." Mr. Ross also expressed an opinion that the Chontales Mines had never been sufficiently explored to warrant more than an opinion as to their capabilities, which seems also borne out. The singular fact was also stated, in this letter, that the enclosing rocks of the Chontales are similar, if not identical, with the enclosing rocks of the Grass Valley of California, and that no mines in the world have equalled the gold mines of Grass Valley. The vast extent of the property of the company and the inexhaustible supply of its ore were alluded to.

Taking into consideration the facts that the company are now 3000*l.* to the good, irrespective of all liabilities; that their property is freehold, without any royalty to pay the American Government; Mr. Bell-Davies inspected the title-deeds of the property when out there, and found them complete, and also that they have a most excellent manager. No doubt many shareholders will remember with pleasure the letter of Mr. Ross, when the affairs of the company were far different to what they now are, who did what he could to cheer them.—*Newquay, Aug.* 9. G. W. H.

ROCK-BORING MACHINERY.

Sir,—We thank you most heartily for the excellent notice of our pamphlet. It suits us tolerably well, and we are glad to hear that our friends are suited. Should be sorry to hear that they were down in the mouth. The ignominy might have been spared us, however, if you had deigned to take notice of our other two propositions. We offered them in good faith. Instead of the 3000 minutes' trial, we should offer a 10 minute trial next time. Suit Cornishmen better.

Paris, Aug. 6. J. A. MacKean.

MINERAL RESOURCES OF IRELAND.

Sir,—I read an article the other day in the Journal of July 21, under this title, which treated of a subject, as it appears to me, of Imperial concern and interests. It is a point outside the sphere of politics, but one on which, it seems to me, that public opinion, both in the House of Commons and outside, wants a little educating and enlightening. In this article the national characteristics of the Irish are treated with great fairness and impartiality, and a very striking description given of the mineral treasures of some parts of the country.

It is a subject I have brought before more than one member of the House of Commons, and hope to bring it before their notice again. I have long been of opinion that it is time the condition of Ireland was treated as a question wholly apart from politics, and simply as a social, economic, and, I may add, a philanthropic question.

Sowdham Vicarage, Aug 7. J. H. Browne.

THE TREATMENT OF TIN ORE.

Sir,—There is scarcely a subject in connection with the whole course of mining pursuits that has commanded and attracted more attention than the treatment of the produce of the tin mines after conveyed to surface, and prior to sending it to the market. The mode of dressing and the most applicable appliances for the economical treatment of tin ore appears at present to be one of the principal topics of discussion in the mining districts of this county. Notwithstanding the similarity of the manner in which the tinstuff is treated and brought to a marketable state, there is a great diversity in the opinion of mine managers and tin dressers on the best and most inexpensive mode of dressing. The study on this branch of mining by men of ingenious abilities has much improved the machinery on the different mines in use for the dressing and pulverisation of the tin produce, there being several various kinds of pulverisers whose merits and capabilities have on many occasions been warmly discussed.

The old Cornish stamps which have stood the test of experience have not been perfected to any considerable extent during the past 30 years; but although the stamps have not undergone a series of alterations there is ample room in some stamping machinery, more especially than others, to make considerable improvements; but, for fear of making this communication too voluminous only one particular part in the construction of this important machinery will be mentioned—the grateway. It is unquestionably the case that a great quantity of the "slimes" spoken of so much around the large tin mines are made at the stamps. The reason for making such an assertion is that there is not sufficient grateway for the stuff to escape after being pounded to its proper size, it being confined too long under the heads and made into slime before forced through the grates. There is a wide variance in the opinions expressed relative to the size and dimensions which the grateway should be for the stamps to perform excellent duty, and make as small amount of slime as possible. In some mines the two grates in front measure about 20 in., or each grate 10 in. by 7 in.; this, I assert is a vast mistake in the construction. I argue that if the stamps were provided with larger grates more stuff would be stamped, and a much less quantity of slimes would be made, which would result in less dressing costs in our extensive mines.

There is quite room in front of the stamps for larger grates, and if they were erected or altered to take grates 2 ft. 6 in. by 10 in., with end grates of proportional size, an estimable improvement would be effected in the right direction. I confidently believe that if the two grates in front were replaced by the one grate of the dimensions which I have mentioned above it will prove a success, and will answer very satisfactorily. S. J. Vincent.

Cheesewring, Liskeard, Aug. 8.

LEAD VEINS IN CONNECTION WITH IRON DEPOSITS.

Sir,—The subject of the interesting and intelligent article under the above heading, in the Journal of June 30, affords the geological student ample scope for his abilities, and opens up a vast field of enquiry. It is, indeed, singular in many districts to find iron on the top or backs of lead veins; and I believe that in the district of Perranzabuloe this phenomena is of more frequent occurrence than in any other district in England. On the back of Gravel Hill and Treamble vein are immense masses or bunches of brown hematite cropping out at surface. The surface bunches are not all connected with each other, as there are large spaces between them where no iron has at present been found. In some of the lead veins of Perranzabuloe it is not unusual to find together iron and silver, the latter in variable quantities, which together with quartz constitute gossan, the local name in Cornwall for this admixture—lead (sulphuret and carbonate), blende, arsenical pyrites, and copper pyrites.

Perransabuloe contains a greater variety of mineral veins in the smallest compass than any district I have hitherto known as within a square mile—tin, copper, silver-lead—the latter in some cases of extraordinary richness. To wit, the Mount vein, where some of the ore sold realised 700*l.* per ton—blende and iron veins are found. All the lead veins of the district have an iron or gossany back, and in some it has been found to a depth of 70 fms., and until the veins get quite free from gossan in depth. Rarely, if ever, are found regular branches or shoots of lead. The depth of the gossan in the lodes varies, which fact to some people appears somewhat strange; but upon taking the highest and lowest position of the surface lines of the veins above the sea level, I think it will be found to run about an uniform depth in this locality. The transition state or the changing of copper veins into tin to the miner or the geologist is a problem worth solving. The mixture of minerals in veins is a question which hitherto has not had the amount of attention paid to it which it deserves, as an explanation or a reason of the cause of this wonderful phenomena might assist the miner considerably. W. Niness.

Perranporth, Aug. 7.

AN HONEST SHAREBROKER—WHERE?

Sir,—One day last week a friend of mine asked me a poser—to recommend him an honest sharebroker. Eh? The idea of such an animal being extant. With every due respect to my friend, the very fact of asking for such a thing stamps him as a greenhorn in confirmation of this. The only speculation in mining he has yet made is in the famous Indian gold mines, which will be the means of immortalising Mr. Brough Smyth's name. If it is not asking too much, Mr. Editor, could you kindly put my friend on the track of one, or insert this letter with the object of obtaining the information he requires about this rare specimen of mammalia from some of the numerous readers of the Journal, as the breed may not be quite extinct. The answer I gave to him was similar to that of Æsop's when questioned as to what he was doing in carrying about a lighted lantern in the middle of the day when the sun was shining brilliantly. His answer was such as that sage could only give—"I am looking for an honest man, as the rays of the sun are not strong enough to find one." Even with the aid of both lights the old gentleman failed to find one; but as this occurred such a long time ago, and, moreover, in days when the electric and lime lights were not dreamt of, although I am rather sceptical as to the success of anything old Æsop failed to accomplish, with the assistance of the electric and lime lights instead of the old lantern, one cannot positively say what might happen in these days of rapid progress in developing every branch of science.—*Perranporth, Aug.* 7. W. Niness.

MINING NOTES AND RECOMMENDATIONS.

Sir,—Mining in Africa, excepting in the diamond fields, is of a limited character, but we have not far to look for the reason of this absence of interest in the mineral resources of this great continent. In the first instance after years spent in exploration—and this means life and money—we know little of its geological characteristics. Few of the travellers who have penetrated the interior have given us any idea relative to its mineralogical resources. The works of Stanley and Cameron on their journeys across the continent are almost void of reference to these features. It is not difficult to conceive travellers passing over such immense tracts of country without making observations of this nature; but I presume that the river routes hardly afforded them favourable opportunities, and besides this time was everything to them, and here and there, if not all the way through, it was a life and death journey. Every praise for the pluck, nerve, and skill which these men showed is theirs. But putting aside what might be found in the interior, and coming to the coasts, we know nothing of the capacities of the country. Even in our own possessions the knowledge of the mineral wealth is comparatively small. The Gold Coast has the promise of a great future, and when the difficulties shall have been overcome which at present prevent the proper development of this reputably rich district, then the real wealth of this despised country will be fully known. For centuries the Gold Coast has had the reputation of being rich in gold, and millions have been drawn from it, and yet all the wealth has come from alluvial deposits. The extent of native mining is confined to mere pit-holes, from 10 to 20 ft. in depth, which are abandoned at the rainy season for the most part. Mungo Park found that this method was followed to the north of the Kong Mountains, and the same plan is adopted, or rather has been the custom to the south of them. North and south of this range of mountains, running east and west, south of the Gambia, there are evidences of the existence of gold, indeed we must acknowledge it a fact. We have then great alluvial deposits in these regions yet to be worked, for it is hardly possible for them to have been exhausted by the natives, who have followed the most primitive modes in obtaining gold. Not only this, the Kong Mountains are as a sealed book, for we have no record of any traveller in these parts.

It is but reasonable to suppose the gold which has been found has in ages past been washed down from this range; whether the King of the Kong Mountains uses a nugget of gold for his throne or not it is impossible to say, if he does it is direct testimony of its abundance, and the coming Stanley or Cameron may persuade him to exchange it for an easy chair. The Gold Coast itself presents a great field for the mining capitalist. The efforts hitherto put forward to work it are puny indeed. True it is that companies have been formed with hundred of thousands for their capital, but the money in many instances has been paid for unproved properties or wasted by inexperienced men. Perhaps with all this less capital has been imported into this known gold field than to any other with which the British capitalist has as yet come in contact. The great barrier to working the mines on the Gold Coast is its unhealthiness. Science and sanitary measures may yet to a great extent remove this. The introduction of officials and miners from Australia to control native labour might be in part a means of overcoming the obstruction. Mining cannot be conducted to the satisfaction of the British capitalist unless it is under the white man's control. But it would not be an impossible thing to train natives for these duties, for the African race, above all other races, is an apt scholar of the white man. If on the Gold Coast he has shown a disposition to possess his employer's property he is not altogether to blame, seeing the examples which have been set him by his white superior. We have coloured men in every call and profession, why not in mining? I would ask those who are able to judge of this matter if a mining school on the Gold Coast would be followed with any national advantages?

It has been suggested, and I should rather say very strongly advocated, that Chinese labour should be introduced to work the mines. With all due deference to the authorities who have advanced this I would suggest that the Hindoos and not the Chinese be encouraged to emigrate to Africa. Constitutionally so it presents itself to my mind, we should be doing ourselves the greater jastice by doing so, than by sending for Chinamen. India is overcrowded as well as China; labour, therefore, is superabundant, and the adaptability of the one people is perhaps as great as that of the other. Beyond this European nations are beginning to see that in Africa there is a great field for commerce, and it therefore becomes a question how the dark continent shall be grasped in the commercial sense. There can be little question as to the intelligence of the Hindoo; and the high educational attainments possessed by many of the better classes would eminently fit them to work in conjunction with our own countrymen in opening up Afrcia. I believe, too, they would become climated to the African soil sooner than any other people. We have taught them, and are teaching them to-day, to think after the fashion of Western nations; therefore, we should the more likely receive greater benefits from the introduction of these, our fellow-subjects, than from aliens.

There is another consideration, the Hindoo would have few objections, if encouraged, to settle in Africa, which would almost be an impossible thing with the Chinese. Chinamen come, and having accomplished their purpose, go. Now, this, some of your readers may say, is all that we want. "We want the labour of these men, and after that they may go where they will—to Cornwall if they like." I contend that we want more. Not a passing influence only upon Africa. We want it to be permanent, and to grow stronger year by year. Unless this is so our commerce with Africa must continue in the same assailable position in which we find it to-day. The contact of nations is for purposes of trade—mutual advantages—and we see that Africa is opening up a good trading ground. We can make ourselves practically the masters of the situation if we do not lose the opportunities which lie before us, and while receiving benefit we think and believe that no other nation could bestow such advantages on Africa as we ourselves. It may be said that the introduction of the Hindoo into Africa would bring about strong feelings of opposition on the part of the natives. If this would be so, then the same thing would occur were the Chinese introduced, and if we argue on such lines as those, then the question of immigration had better stand where it is. The question is so important that it is not one, I think, which should not be left in the hands of commercial interests absolutely to decide. It has become a national question, and worthy of the greatest consideration of the Government. France, apparently, is attacking Africa in earnest. Its interests in the northern part of the Continent are matters of history, but it is the something new to see her on the East and West Coasts in the assuming attitudes which she has put on, and we stand by and let her pass. Were our Government to spend large sums of money to further our commercial advances in Africa, instead of leaving it entirely in the hands of commercial men, we should reap large returns. They overlook a work of this sort, and yet do not hesitate to propose financial support to an alien power in the war of trade, and no compunction is felt for the immense sums spent in war and the preparations for war. While the one would add to our wealth by the certain means of widening the roads of commerce, the other brings misery and loss on all sides.

France has been busy in planning to cover the Sahara with water. Why France any more than England? Some years ago a Scotchman conceived the same idea, and showed that at a point south of Cape Juby on the Atlantic seaboard the sea could be let in by means of a short canal, the reputed natural channel which in the course of years had become choked. France will make the sea, and secure the monopoly; in the same way that she has done at Suez, and certainly after expending large sums in making a new sea she would have a right to interfere with any other nation who should attempt to make another entrance to it. This sea whenever made must be the key to Africa, the Nile and Zanzibar would be mere bye-ways. We now possess the control of good positions, and have greater influence, perhaps, than any other power in Africa; but we are fast coming on the times when we must make greater advances than we have done in the past in the ways of commerce, or fall back altogether. We can advance, for we have everything in our favour, but to allow other nations to take the van would be national ruin. A million pounds a-year expended by us in carrying our own countrymen, together with Hindoos, into the interior of Africa, arming them, and giving them every support and encouragement in agriculture and commerce, and also in constructing light railways, would not be missed. In a few years time—not a hundred—we should be well repaid, and we should have the satisfaction of knowing that we had the control of trade. It looks as though the times are positively bringing us to that state when we shall be compelled to consider the African question, and to bring all our energies to bear on developing the country; existence in overcrowded nations will depend on it. We are told that the natural resources are great, and that in parts it is healthy and suitable for Europeans. The whole continent wants the spur of civilisation, and then, bringing that about by the best means possible its future will bear a different aspect. I see no reason why a giant company, on the lines of the East India Company, could not be established. I feel persuaded that such an enterprise promoted for the national good would be soundly supported. The best means of bringing the subject fully under public notice would be to have a grand council of our great African travellers, our Camerons and Stanleys and Burtons, our statesmen, capitalists, and merchants, and so discuss the subject, for I believe that no commercial question demands and deserves such attention as does Africa at the present time. I have been somewhat drawn from the first purpose of this paper, which I must continne in your next.

E. R. Gabbott.

DOLCOATH MINE, AND ITS MANAGEMENT.

Sir,—I used to live in Cornwall. I know the management of Dolcoath. The Williams's, of Scorrier, have had virtually the control of this mine for years and years. The Williams's are a clever, astute family. Dolcoath sells 80,000*l.* to 100,000*l.* of tin every year. The Williams's buy most of the tin, and there is virtually little or no competition for the ore. The tin is, I believe, never weighed before it leaves the mine. The tin smelters fix their own standards, and to a great extent fix their own price.

Dolcoath Mine is managed by a committee, chiefly of merchants. Mr. Williams, the tin smelter, is a very active member of this committee, and buys probably 60,000*l.* worth of their tin ore every year. He also supplies Dolcoath with thousands of tons of coal every year, worth many thousands of pounds. One of the Williams's—the Chairman of Dolcoath meeting on several occasions lately—is a merchant, and supplies through the Gweek Company many hundreds of pounds worth of merchandise every year. The Williams's are the bankers of the mine, and scores of thousands of pounds pass through their hands every year. Dolcoath Mine, although if properly managed they ought to have kept a good credit balance, has always been in debt—in debt—in danger—in difficulties—we used to say—has always had an overdrawn account, consequently heavy sums of money have to be paid every year as bankers charges, interest and commission on account, &c.

Well, Sir, in consequence of gross mismanagement a trusted clerk has played "old Harry" with the shareholders, and about 12,000*l.* worth of false shares have been issued, for which I suppose the shareholders will have to pay, in addition to a fine of 25,000*l.* lately imposed by the lord of the mine (Mr. Basset)—just 40,000*l.* altogether.

Will you believe it, Sir, that when it was proposed at Dolcoath meeting on Monday last to add one or two names, independent men, on the committee to consider ways and means and the future management of the mine--buying, selling, managing, &c.--it was opposed "tooth and nail" by the powers that be. It was proposed to nominate a small committee to confer with the committee of the mine as to how the 40,000*l.* was to be dealt with, &c. "But no, this cannot be. We cannot allow outside shareholders to know anything about our preserves. That is our business, not yours."

Capt. Josiah Thomas, the manager of Dolcoath, has also had the management of many other mines, I understand. One would have thought that Dolcoath was enough for one captain to manage, but not so, say the committee of Dolcoath. I do not know how many mines he now manages; but Cook's Kitchen, New Cook's Kitchen, West Frances, South Crofty, West Shepherds, were and perhaps are under his control, and also, if I remember aright, West Seton and others. Captain Thomas stated on Monday that if he were to give up the management of Dolcoath to-morrow he could have five times the salary he has there, perhaps more. He now has, I think, about 335*l.* a year at Dolcoath; five times that would be 1675*l.* a year.

The talk of Mr. Henry Rogers that the additions to the committee might interfere with the settlement of the lease with Mr. Basset was so much dust thrown into the eyes of the adventurers. The majority of those present at the meeting voted in favour of Mr. Heard's motion, that a committee should be appointed consisting of Messrs. T. S. Bolitho, M. H. Williams, J. R. Branwell, W. Rich, T. W. Field, and two others, and the Chairman subsequently said Mr. Heard's motion was carried. Later on the Chairman, however, proposed to use proxies, but, of course, these could not then be utilised. But Mr. Heard, seeing the feeling of the influential committeemen was against his movement withdrew his motion, and so the matter rests. But was it wise, was it judicious, was it altogether the right thing, to ignore the out-adventurers? Is it wise for the merchants to manage mines altogether? I think not, Will not the day of reckoning come?

The smelters, the bankers, the merchants, the engineers, the mine agents, and most of the brokers voted against the motion for a small addition to the committee.

The statement made at the meeting that some of the committemen had signed blank cheques did not altogether tend to their renown. It showed implicit confidence in Capt. Josiah Thomas; and Captain Josiah Thomas said he had put implicit confidence in John Mayne, who has robbed the adventurers to the tune of 10,000*l.* Is it wise for a public company to trust anyone or any committee without independent supervision? Capt. Thomas was down on the Press; but I

thought what he said proved the importance of the Press greater than ever. I do not think he disproved a single statement of importance. ADVENTURER.

EAST CHIVERTON.

SIR,—A short time since it was high water with us, now the tide has ebbed, and it is low water again, but it is just on the turn. How is it that we have no glowing accounts about the mine in the Journal at the present time? Is it because those who sold shares when it was high water, and thereby caused the ebb, are now busy picking them up again, and would have as little said about the mine as possible? The shares must be of the same value now as then; I presume they are more valuable—a much richer lode has been struck, proving that the richest part of the mine is at the 100 fm. level. Explorations have been made proving that the lode holds good to the 90, and that it is the largest and most productive at the 100 fm. level. The shaft has been enlarged and machinery has been erected; the value of the plant now on the mine must be between 2000*l.* and 3000*l.* The 100 fm. level in East Chiverton is at the mean level as the 80 in the adjoining mine—West Chiverton—where the rich lode commenced which raised the shares to 80*l.* each; lead was then at a higher price. Lead is at a very low price now; but at East Chiverton we are selling the ore from the new lode at the same price as pig-lead. It seems to be forgotten that East Chiverton is a silver-lead mine. I remember when our ore was selling above 20*l.* per ton—I think as high as 24*l.* I also maintain that the real value of a mine like ours must steadily increase if the bottom level is richer than those above, and that the real value of the property to *bona fide* investors does not fluctuate with the rise and fall of shares for market purposes. I shall be glad to have the opinion of the value of the property by some of the large shareholders and *bona fide* investors in the mine.—*Cowes, Aug.* 2. A. V. O. S.

TANKERVILLE GREAT CONSOLS.

SIR,—Referring to my letter in last week's Journal, perhaps a few particulars respecting the above company may be interesting to your readers. There has been expended since the formation of the company—November, 1880, to May 2, 1883—Monthly cost, labour, and materials, 55,935*l.*; royalty, 1021*l.*; printing, 304*l.*; directors' fees, 1843*l.*; secretary, clerks, and office expenses, 703*l.*; preliminary expenses, 408*l.*; law charges, 898*l.*; dead rents, 60*l.*; sundries, 381*l.*: total, 61,553*l.* The lead and blende sold during the same time has been as follows:—Lead, 2071 tons for 18,626*l.*; blende, 830 tons for 3411*l.*; total, 22,037*l.* These figures show the great extent and intrinsic value of the property of the company, and a very encouraging indication of its productiveness as soon as the mines are worked upon the lodes, to reach which the above heavy expenditure has been incurred, and now showing signs of very early and great results. But for the very low price of lead ore for such a long time past, the financial position of the company would be very different to what it is now, and no one can dispute that the property is one of great value, and its prospects excellent.

This should encourage every shareholder to at once take up his proportion of the remaining third of the preference shares issued last October, and at the same time I think the directors and local management should reduce expenditure to the lowest possible point, and be willing to make some personal sacrifice until the property is in a prosperous condition. A rise in the price of lead ore would quickly alter circumstances; but that cannot be relied upon, and the aim of the management should be to make the property at least self-supporting, even at the present exceptionally low price of lead ore. No doubt the small amount required will be promptly subscribed; and I am reliably informed that the financial results of the company's operations since the last balance-sheet, presented up to May 2, show a great improvement.—*King's Norton, Aug.* 8. J. W. H.

ROYAL CORNWALL POLYTECHNIC SOCIETY.—The fiftieth and Jubilee Report of this society has just been issued and forms a handsome volume of about 600 pages. The various machines and processes bearing upon mining and metallurgical matters brought before the society having been fully referred to in the *Mining Journal* at the time of the meeting, it will suffice to say that in the report the exhibition details are given quite as fully, and in many cases rendered particularly clear by the insertion of well executed illustrations. There are ample details of the lectures and conferences, of the bee show, and of the excursions; and as the question of the relative merits of rock-drills is one which has since been raised it may be interesting to quote the report of the rock-drill competition at Falmouth. It is stated that six rock-drills were exhibited, and all—with one exception, the Barrow—took part in the competition, under the direction of Mr. Hosking. Most of these machines were not, however, new to the society. The competing drills were:—The Eclipse, Hathorn and Co.; Cornish, McCulloch and Holman; Stephens, Richard Stephens and Sons; Beaumont; and Excelsior, J. H. Wynne. Very great interest was manifested in the trials, which extended over two days; and the various machines were worked both upon granite and hard tin capel. As the result the first silver medal was awarded to the Cornish rock-drill of Messrs. McCulloch and Holman, and the first bronze medal to Messrs. Stephens and Sons. The conditions of the competition were:—1. Competitors shall mount their machines on the bar provided for the purpose. 2. Competitors shall bore in the same stones—(*a*) One hole in perpendicular direction in one stone. (*b*) One hole at an angle of 45° in another stone. 3. Each machinist will be required to remove the cylinder ends of his machine for the judges to measure the diameter of the cylinder; they will also measure the size of the borer before the boring commences. 4. Each machine will be required to bore a hole of a diameter equal to one-half of the diameter of the machine. 5. After the boring, the cubical contents cut will be measured by pouring water into the hole, or by some other method. 6. The air used by each machine will be measured as well as the rock cut. 7. With a view to testing the utility of the machines, the time will be noted from the time the boring commences to the end, including the time occupied in changing the borers. 8. The position of the holes in the rocks will be marked by the committee and numbered one, two, three, four, &c., and the holes to be bored by each machine, as well as the order of boring, will be decided by ballot.

TECHNOLOGICAL EXAMINATIONS.—It is yearly becoming more apparent to employers of labour that those who obtain the best positions in the technical schools which have during the past few years become so fashionable in this country, usually make the least competent workmen, and frequently fail to make a living for themselves or profits for their employers, so that it is not surprising that the interest and apparent success which is often observable at the opening of a technical school or institute soon dies out leaving the concern in a miserable condition, if it does not collapse altogether. The report of the City and Guilds of London Institute for the Advancement of Technical Education affords some clue to this failure. The men chosen for examiners are utterly incompetent for the task, since the questions they put to the candidates and their observations on the answers are sufficient to convince those actually engaged in the trade which it is philanthropically intended to benefit that ability to satisfy the examiners is indisputable evidence that the student has not been instructed by a competent workman. It is but a few years since that in this same Institute one of the questions put to those who went up for examination in Printing was as to how they would print so that each line would read from the middle toward each end—a piece of eccentricity which would not usually be required in the composing room; and now one of the examiners, Mr. Joseph Wrigley, has actually the assurance to state that the attention of both teachers and candidates should be directed more to principles, and that matters of detail are comparatively of small value; yet it is attention to detail, which Mr. Wrigley would ignore, that makes the high-class workman and secures the prosperity of an industry. Another examiner, Mr. C. A. Wright, F.R.S., is rather illogical and slightly given to the use of slang; he thinks "some of the indifferent teachers have been 'choked off,' so that there is an improvement on the whole in the teaching." Mechanical engineering appears to be a favourite subject with candidates, no less than 566 out of the 2397 candidates offering themselves for that subject, but whether the 344 who passed would be more readily employed than the 222 who failed is more than doubtful. For examination in iron and steel manufacture there were but 92 candidates this year against 156 last; Mr. Wright thinks the decline is because the teachers were "choked off," but the inutility of the examinations may have been a still stronger reason. In Illuminating and Lubricating Oils, Lace Manufacture, Silversmiths' work, and Mechanical Preparation of Ores no candidate was examined, and it will be very surprising if the number of dropped subjects does not each year increase.

REPORT FROM CORNWALL.

Aug. 9.—Dolcoath is, of course, once more the chief topic in mining circles. There is a by no means unimportant tendency to regard the proceedings of the meeting on Monday as unsatisfactory, nor are we prepared to deny that this feeling is without some grounds. On the other hand, the weight of public opinion, and rightly so, tends in the contrary direction. The differences are, after all, mostly upon matters of detail, and the final outcome of the meeting has, we may hope, secured that there shall be that full and thorough examination into, and report upon, the affairs of the company which is just now the one thing needful.

It is idle, or worse, to indulge just now in recrimination, the real point is to ascertain clearly where the mine stands, and to start safely upon the new basis. Let it be admitted that there have been technical breaches of the law in the non-appointment of a purser and the like. It may or may not be so, but let it be admitted. Does anyone really believe that that would have prevented the occurrence of frauds, perpetrated with so much ingenuity as those of Mayne? Again, let it be admitted that Capt. Josiah Thomas was wrong in condoning an offence which he had every reason to believe had been perpetrated five years before, and his only knowledge of which was the confession of the culprit. Can it be seriously argued that that condonation in any way led to the creation of the enormous bulk of the fictitious shares, seeing that at the time this happened 198 of the 203 false shares had been issued? Capt. Thomas might have acted unwisely; but if he erred he erred in company with Mr. Pike, and in no way made himself responsible for Mayne's pilferings. Perhaps after all Capt. Thomas has not so much reason to complain of the newspaper criticisms, as he was inclined to hold; they have afforded him an opportunity of making certain explanations that circumstances had rendered necessary, and of this once for all putting an end to rumours, which could not affect his character with anyone who knew him; but were calculated to mislead the distant and uninformed. One of the worst features of Mayne's conduct in trying to evade the punishment he so richly deserved was the handle it afforded, wittingly or unwittingly, for malicious aspersions, which could not be met straightforwardly, but were none the less pointed.

There is an end, however, to all this now. Capt. Josiah Thomas's reputation as an honourable man never stood higher than it does at this moment. If there is blame it must be pretty well divided, and at the most it cannot be carried beyond a too implicit confidence. It is all very well for gentlemen to suggest now that suspicion ought to have been aroused by the style in which Mayne was living. If so, all who were acquainted with the salary he drew at the mine were equally in fault, and so, whatever looseness there may have been in the management of details, the adventurers generally are in their degree responsible for. The management of any concern must in the long run be what those who are chiefly interested make it, and experience has proved again and again that a clever rogue may for a time outwit a host of shrewd men of business. The most important point touched upon at Monday's meeting was really the question of the management. Is the mine in future to have Capt. Thomas's undivided services or not? If it is then the adventurers must be prepared to pay; and we are far from saying this would not be a wise course to adopt. It is quite certain that Capt. Thomas has amply earned every farthing he has ever received from the Dolcoath adventurers. It is quite certain, too, that he can command at almost any moment a far larger salary than that which they pay. Perhaps in no line of business are managers so miserably underpaid as in Cornish mines, so that the extension of their operations has become a necessity The course is very clear. If it is thought desirable that Capt. Thomas shall confine his energies to Dolcoath he will have to be paid accordingly. If he is not to be paid for the full value of his time and experience then he must either sever his connection with the mine—the last thing anyone would like to see who wishes well, not only to Dolcoath but mining generally in the county—or the adventurers must be content with such a proportion of his services as they are prepared to pay for. As to the constitution of the committee—though we hold Mr. Heard to be in the right—that seems to us of far less importance than the thoroughness of their report, which will now be looked forward to with the greatest interest. Upon it depends wholly the value of the new start, and if it is not satisfactory it must be made so.

REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

Aug. 9.—Manufacturing coal is in a little better position this week, the demand from the ironmasters in those localities where the ironworkers strike has lasted longest, having now revived; rather more work is therefore doing at the pits, and prospects are altogether brighter. Furnace coal is officially 10s. per ton, but some supplies are being got at 9s. 6d., and even less. Forge coal is 7s. 6d. to 6s. 3d. per ton. The advance in Cannock Chase house coal of 1s., referred to last week, is likely to have a quietening effect upon the demand for a while. The pig trade is somewhat improved, but prices keep easy. Hematites are 60s. to 62s. 6d., and Derbyshire pigs 47s. 6d. Native part-mines are 45s. to 47s. 6d. Manufactured iron is better, but prices are unchanged at 7*l.* 10s. for marked bars, and 8*l.* 10s. for sheets (doubles).

The ironworkers' strike is now at an end. The Strike Committee have themselves formally communicated the fact to the local papers. The struggle, after lasting five weeks, against a drop of 3d. per ton in puddling, declared under the sliding-scale, ended on Monday by the whole of the men in the Smethwick and Westbromwich districts consenting to resume at the drop. The pecuniary support which they were getting was very small, and to this must be attributed the collapse. On Monday the Committee of Masters appointed to distribute the subsidy of 5*l.* per puddling furnace to the Westbromwich and Smethwick masters, who were standing, met in Birmingham, and posted to the proprietors of 17 works cheques amounting in the aggregate to 1420*l.*, which represented 284 furnaces. And thus closes a most unhappy struggle.

At a meeting in Birmingham to-day of the Committee of the Iron Trade, at which the strike was reported as over, it was announced that the employers' section of the Wages Board intend to adhere strictly to the terms of the sliding-scale award concerning present and future wages until some alteration has been amicably arranged. Failing an agreement, any disputed question must be referred to the President, Mr. Averley, as arbitrator. Mr. J. B. Cochrane, of Dudley, was to-day elected Chairman of the masters' section of the new coal trade Wages Board. The men's delegates meet the masters on Monday .

The probablities concerning the new Wages Board in the coal trade are being eagerly discussed by the men in some of the localities. At a meeting held a few days ago at Old Hill to consider the wages question, Mr. Winwood, miners' agent, stated that the men were not in any way prepared to accept the Board unless the basis of the scale gave to the Thick coal men 3s. 8d. "per day," and the Thin coal men 2s. 10d. "per day," or shift. He, however, admitted that he was afraid they would not get this amount "unless they were united to a man." He strongly advised the men against working overtime, as by this means they were losing the eight hours system. Mr. Winwood alleged that some of the masters were giving the loaders in the Thick coal 3s. 5d. "per day" instead of the minimum of 3s. 8d. "per day." The meeting closed with a resolution pledging the colliers to unite more closely together.

Every effort is being made by the colliers' leaders to get support for the men in North ffordshire, who continue on strike. A mass meeting was held at Netherton on Tuesday with this object, and it was addressed by, amongst others, Mr. W. Pickard, of Lancashire. It was resolved—"That this meeting is of opinion that the time has arrived when all men working in and about the mines in South Staffordshire should do all that lies in their power towards assisting their fellow men in North Staffordshire in fighting the battle of right against might, and that we do hereby pledge ourselves to do the same." Whether the resolution will be carried into effect with much earnestness is questionable.

A meeting of the Committee of Management of the South Staffordshire Coalmasters' Association was held at the Queen's Hotel, Birmingham, on Thursday, Mr. J. B. Cochrane (Dudley) was unanimously elected Chairman, and a large amount of routine business was transacted. With respect to the proposals to form a Conciliation Board, or to adopt some other mode of regulating wages in place of the present sliding-scale, and settling other questions between masters and men, no definite action was taken. It was, however, decided to meet the 12 representatives of the Miners' Association at a conference to be held in Birmingham on Monday, when all questions affecting the mutual interests of masters and men will be discussed, and some decision will probably be come to on the question of a Conciliation Board.

REPORT FROM DERBYSHIRE AND YORKSHIRE.

Aug. 9.—So far as trade is concerned there has not been much change of late, excepting as regards the quantity of coal sent during the past month to London. For the season the tonnage sent has been something extraordinary, so that a *resumé* of the traffic of late by railway cannot fail to be interesting.

In connection with the coal trade, it is not only a singular but an almost unprecedented fact that more coal was sent to London by railway in July than in any previous month of the year. So far as the railways are concerned, the total quantity sent in July was 63,882 tons in excess of what was forwarded there in the corresponding month of 1882. The consumption, no doubt, was heavier there than has usually been the case in July, owing to the weather, whilst the low prices no doubt induced the large consumers to stock their cellars for the winter. Still the increased trade done was not of much benefit to the colliery owners, seeing that they have been paying higher wages to the miners than they did when coal was at least 1s. per ton higher than it is at the present time. The statement made in the last report with respect to the determination of some of the Scotch colliery owners whose pits are close to the seaside to send their coal to London on a large scale by means of powerful steam vessels has been fully verified, for it appears that the Great Eastern has been chartered to run between Queensferry and the Thames. The vessel will take 20,000 tons of coal in sacks on each trip, and deliver it into consumers cellars at 16s. per ton. This will be about 5s. per ton below the present price of Silkstone coal with the existing railway rate, however, the inland colliery owners are unable to compete with those whose pits are close to the shipping port. Taking the West Riding of Yorkshire as an illustration, it appears that the cost of carriage of coal, with the terminal charges and cartage, amounts from 12s. 6d. to 13s. per ton, so that it is simply impossible for coal costing so much when it reaches the Metropolis to compete with the Scotch coal delivered at 16s or 17s. per ton.

It has been suggested that some expense would be saved were the coal sent by railway to be put into sacks; but this the colliery owners, as yet, do not consider practicable. Still, as great changes are about to take place in the London trade, there is no reason shown why the filling up sacks should not be carried out at the mine-end instead of at the opposite one, as by so doing considerably less slack would be made. Of late, it may be said that rather more inland coal has been sent to London for steam purposes; but this has not been for the supply of steam vessels on the Thames, seeing that the charges for the transshipment of coal at any of the docks is practically prohibited. This branch of the coal trade is almost entirely in the hands of mine colliery owners, those whose mines are near to a sea-port, and sending direct by sea. There is, however, some prospect of a change, seeing that the colliery owners are now promised access to the sea by means of what is now known as ship-canals, and collieries are now being opened out nearer to shipping ports than was formerly the case, and this is more especially the case as regards the coal fields in the West Riding of Yorkshire. As to the traffic of late, it will be seen, from the following figures, showing the tonnage carried by the various lines of railway during the last three months:—

	May.	June.	July.
Midland.....Tons	169,739	172,631	186,620
London & North Western.	129,316	127,858	130,600
Great Western	100,232	71,255	106,679
Great Northern.....	95,492	74,230	100,676
Great Eastern	55,376	56,589	65,282
Other lines	6,753	7,258	7,457
	556,909	509,821	597,314

It will be seen that the Great Western carried 35,424 tons more in July than in the previous month, the increase being from the collieries in the South Wales districts.

The Great Northern also shows a marked increase in the tonnage carried in July as compared with the previous month. An increased tonnage was sent over the line last month from the Pinxton, Eckington, Riddings, and some other collieries in Derbyshire, as well as from the pits of Messrs. Newton, Chambers, and Co., the Sharlstone Company, and several others in the West Riding. The Midland, as usual, took most of its traffic from Derbyshire last month, being credited with 13,800 tons from Clay Cross, 9800 tons from Grassmoor, 9000 tons from Blackwell, and 8000 tons from Eckington. The Pinxton Company, selling lower than other owners and merchants, forwarded during last month upwards of 8000 tons. Riddings also sent 10,600 tons by the various lines, and Staveley 7800 tons. The Boythorpe Company have been working upwards in the London market, and last month sent there about 6000 tons. Fourlee Colliery, near Chesterfield, sent 149,000 tons of coal, or one-fourth of all the coal that was carried to London by railway during July. The Great Eastern in July also done better than usual, although the increase was not more than 6000 tons. The coal is put on to the Great Eastern by other lines, principally the Midland and Great Northern, and during the last month there was put on to it 3000 tons from Clay Cross, 2700 tons from Blackwell, and 3500 tons from Gawber Hall. A large tonnage was taken from Nottinghamshire last month, Annisley heading the list with 11,900 tons, Hucknall following with 11,700 tons, Linby being next with 11,400 tons. The tonnage carried by the different lines during the first seven months of 1882 and 1883 was:—

	1882.		1883.
Midland .....Tons	1,116,827	.....	1,283,472
London and North-Western ..	809,639	.....	923,420
Great Western	541,074	.....	594,656
Great Northern	541,759	.....	631,514
Great Eastern	399,126	.....	425,910
Other lines	53,986	.....	54,668
Total	3,558,411	.....	3,913,150
Increase			354,739

TRADE OF SOUTH WALES.

Aug. 9.—The Steam Coal Trade has been influenced this week by the Bank holidays, the Cardiff National Eisteddfod, and the general disarrangement of business transactions consequent thereon. Coal and iron have had to give way to music and song, as the working classes here are more or less connected with the various choirs which enter into competition for the prizes. The amount sent away from Cardiff last week was 149,718 tons foreign; Newport, 39,490 tons foreign, and 19,126 coastwise; Swansea, 19,460 tons foreign, and 4758 tons coastwise. The best double-screened are quoted firm at 11s. 9d. per ton, while colliery-screened stand at from 10s. to 11s. Small steam coal is in active demand at 5s. per ton.

The Iron and Steel Trades are well supplied with orders at extremely low prices, and but few new orders are coming in. Cardiff sent away 3085 tons last week, and Newport one of 1200 tons to

Buenos Ayres. The iron ore trade is in a very depressed state. Cardiff received 10,741 tons last week from Bilbao, and 1090 from other places; Newport, 12,030 tons from Bilbao, and 2100 tons from other places. The price stands at from 13s. 6d. to 14s. per ton, with a weak market.

The Tin-plate Trade retains its recently improved condition. But I. C. coke are quoted at 17s. per box, while inferior sorts are from 16s. to 16s. 6d.; some common brands are being sold as low as 15s. 9d. Charcoal-made are from 18s. to 20s. per box.

TRADE OF THE TYNE AND WEAR.

Aug. 8.—The position of the Coal Trade generally is unchanged. There continues an excellent demand for steam coal, and its price is well maintained; most of the works in Northumberland are fully employed. The agitation amongst the miners respecting the house-rent question has subsided considerably, full work has contributed to this result, and at the same time the owners are in many cases erecting additional houses for the accommodation of their workmen, so that this vexed question is now likely to be permanently settled in a satisfactory manner. The longwall system has now been introduced pretty generally in this county in working the Thin steam coal seams, and the result is most satisfactory, as by it large coal is produced, and the use of powder is scarcely required; the coal is, therefore, brought to market large and uninjured by blasting, consequently they will stand carriage and the effects of weather much better than formerly. The branch line of railway constructed by the North-Eastern Railway Company from Alnwick to Wooler is a step in the right direction, and it will confer great advantages on that district, but it is only a partial measure. A central Northumberland railway is still required on a larger scale; this line would open out an extensive area, where coal seams, limestone beds, and lead ores have scarcely been touched. It would also greatly add to the agricultural value of the land.

In Durham there is generally a good enquiry for all kinds of coal and coke; the demand for gas coal is improving, and a fair price is now got for this coal. House coal is also improving, although there is not much change to notice in the value as yet. There is an excellent demand for small, nuts, and manufacturing kinds, and the enquiry for bunker coal for steamers has been so great lately that the price of this coal has been enhanced to some extent. The duty on coke imported into Spain has now been reduced, and some other vexatious charges on shipping trading with that country have been abolished altogether, so that increased trade may now be expected with that country, which produces so much iron ore, lead, &c., required here. The shipments of coal, coke, iron, fire-bricks, and other fire-clay goods, cement, &c., at the Tyne Docks and at the other docks and shipping places on the Tyne and Wear have been large during the past week. In South Durham the sinking operations, which have been rapidly pushed forward at Chilton Colliery, Ferryhill, are now completed: 45 fathoms of sinking has been accomplished, and the progress made has been extremely rapid. The process of walling the shaft, and putting it into order for winding, is now being attended to, and there is a better prospect for this district if a dispute between the South Durham Coal Company and Lord Eldon were settled, and this is expected to be accomplished shortly.

There is little change in the state of the Iron Trade; both raw and finished iron is unchanged in value during the past two weeks. On Friday the Cleveland ironmasters' returns were issued at Middlesborough. They show that during the past month there were 118 furnaces in blast, 46 furnaces out, out of a total of 164 furnaces built in the North of England. This is a decrease of two furnaces producing pig-iron, as compared with July, 1882. The make from the 118 furnaces during July was, for the whole district, 155,680 tons. This was supplemented by 75,504 tons of other kinds of iron, including hematite, spiegel, and basic iron, thus augmenting the total make up to 231,184 tons, which is an increase of 5263 tons as compared with June. The makers' stocks of Cleveland iron in the port of Middlesborough amount to 128,326 tons, which is a decrease of 12,330 tons as compared with June. Outside Middlesborough the stocks are 42,226 tons, which is an increase of 1245 tons—thus reducing the decrease to 11,085 tons. There are also in makers' stores 21,812 tons, North-Eastern railway stores 4210 tons, and in Messrs. Connal's stores 73,667 tons; thus making the total stock 270,241 tons, as compared with 275,094 tons stocked at the end of June, shows a total decrease of 4853 tons. The total shipments for July amount to 85,217 tons, which is an increase of 10,906 tons, as compared with the corresponding month last year. The manufactured iron trade has been firm, and steady in price, though business has been rather checked, as manufacturers are standing firmly out for present rates at all events. Pig-iron is somewhat lower, but there is little change in quotations of iron of any kind during the past fortnight. Shipments of pig-iron for the week ending on Friday last were 16,830 tons, against 15,658 tons in the previous week. There was a very heavy shipment of manufactured iron and steel, amounting for the week to 13,494 tons.

The annual general meeting of the North of England Institute of Mining and Mechanical Engineers was held in the Wood Memorial Hall, Newcastle-on-Tyne, on Saturday—Mr. John Daglish in the chair. Mr. Theo. Wood Bunning, the secretary, read the report; the income of the past year was 1970*l.* 1s. 1d., or 206*l.* 8s. 9d. less than last year. This is accounted for by the extra half-yearly dividend obtained last year, by a decrease of 40*l.* 17s. in the amount of subscriptions, and a decrease of 84*l.* 12s. 5d. in the sale of the Transactions. The income has exceeded the expenditure by 157*l.* 9s. 11d., and the committee have to report that the year has been a fairly average one, and that the finances are in a highly satisfactory state. This is the 31st year of the Institute, and the number of members and the income of the Institute continues large. There have been constant additions to the library, and a large and valuable collection is now held of books purchased, obtained by exchange with other societies, and Transactions, the contributions of members. During the year two very important excursions have been enjoyed by the members, one at the invitation of Sir Edward Watkins to visit the Channel Tunnel works at Dover. The trip was a most enjoyable one, upwards of 120 members availing themselves of the opportunity to inspect the important works at the Tunnel, and the amount of information gained by an inspection of the works was great. The boring machine by Cols. Beaumont and English, and the air locomotive by Colonel Beaumont, which were set at work by the permission of the Board of Trade for the occasion, enabled the members to form a correct idea of the facilities which could be afforded by these powerful machines in the construction of the Tunnel should the time arrive for practically carrying out the work. The second visit made by the members was to Barrow-in-Furness, through the invitation of Mr. J. J. Smith, and the directors of the Barrow Hematite Steel Company. About 130 members availed themselves of the invitation, and they were received with great hospitality, and the whole of the mining and manufacturing industries of the district were thrown open to their inspection. The papers read before the Institute during the year have been varied and interesting.

A new bridge is projected over the Tyne, and the Corporations of Newcastle and Gateshead have taken the matter up. It has been discussed to some extent already, and it will be still more amply considered and agitated in the future. At present the most important bridge for the use of the large and increasing populations in those two towns is in the hands of the North-Eastern Railway Company, and that great company has never been famed for conciliation or much consideration for the interests of those who happen to fall into their hands, or the general public. The High-level Bridge is famous, and it is, no doubt, the best monument to the memory of Robert Stephenson. The upper part of the bridge is a railway passage having two lines, and the passage of minerals, goods, and passengers in this part is very great, and the company derive great profits from this portion, as they have the power to levy heavy charges on all kinds of traffic on it. The underpart contains in the centre a carriage way and footpaths on each side, and a great revenue—variously estimated at from 35,000*l.* to 50,000*l.* per annum—is derived from the tolls levied on carriages and passengers in this part. The people of this district wish to have a free bridge very naturally, and they wish also to have lines of tramway on the bridge to connect the tramway systems in the towns, which have now been developed to a considerable extent. It is not at all probable that the railway company will agree to any proposal either to make a new bridge or to place tramways on the present bridge. The Corporations of Newcastle and Gateshead ought to take the matter boldly in hand, and procure an Act of Parliament for a new bridge. It would, without doubt, prove an excellent speculation, and a free bridge could be arranged for in a few years after its construction.

The Chemical Trades on these rivers continue to steadily improve. There is a very strong demand for bleaching powder, at prices far above those realised at the commencement of the present year. other chemical products are also improving in value, and altogether the prospect for this important trade has greatly improved during the present year. When the workings of the salt beds on the Tees are further developed the trade will also be placed in a better position than it holds at present. The great Newcastle Chemical Company are about to commence boring two holes to work the salt for their own consumption.

REPORT FROM NORTH WALES, SALOP, AND CARDIGAN.

Aug. 9.—For the time of year the North Wales coal trade is quite as good as usual. The ironworkers are fairly well employed. The terra-cotta, brick, and sanitary ware trades are fully employed. The freestone and limestone quarries could do with more orders. The better class of slate quarries are in full work, and the slab and school-slate works active. The paving sett quarries near the coast are doing well, but for those inland the prices obtained are not remunerative for land carriage. Further subsidences of land are taking place in the salt district, and orders have been given for either the removal of the Northwich Town Hall, or for works to ensure its safety.

ELECTRICITY, AND COLLIERY OPERATIONS.

Probably the most interesting paper, read at the recent Liége meeting of the Institution of Mechanical Engineers, was that on the Application of Electricity to the Working of Coal Mines, by Mr. Alan C. Bagot, M.E., of London. Directing attention in the first place to the application of electricity to signalling purposes, the author referred to the inconvenience of the hammer and plate system which was once in use, and stated that his experience shows that in cases of accident traced to defective signalling contradictory explanations were generally offered by those in charge of the signalling appliances. Again, in the case of inclined planes underground driven by an engine on the surface, unless the latter can be signalled to stop instantly from any part of the road, fatal accidents will be of such frequent occurrence as to render any extensive scheme for such haulage a matter of grave responsibility to the manager, and of great and unnecessary risk to the men. A further source of danger was, in his opinion, present in foggy weather, where the engine driver had nothing to guide him but the shaft distance indicator required by the Mines Regulation Act. It appears that between 1874 and 1877 he made a series of experiments in different shafts with a view to determine whether insulated cables, naked copper wire, stranded copper or iron wire, or galvanised iron telegraph wire, was the most suitable conductor for conveying the current in the shafts. The result of trials in several different districts showed that insulated cables were too expensive in the first instance, and also were practically useless, being stripped and destroyed by falling coal from the cages, &c., and especially liable to electrical leakage. What was still worse, they were subject to a form of back charge, due no doubt to the coating of coal dust which adhered to the sheath of the cable. Further, their position did not allow of their being readily tested or inspected, and unnecessary delay took place in finding disconnections and other electrical faults when the cable was not manifestly disturbed or injured.

The conductor subsequently found most suitable was No. 4 (about ¼ in.) galvanised iron telegraph wire for shaft conductors, and No. 8 (about 1-6th in.) for engine planes. The shaft conductors were hung vertically from shackles on the pit frame to the bottom of the shaft, without any intermediate support, the depth in some cases being 600 to 700 yards. The conductors were provided with wooden blocks on each side of the wire, screwed tightly together with thumb screws, to act as safety clips, and to prevent the wire from falling down the shaft in the event of an overwind or explosion carrying away the shackles on the pit frame. To the lower end of each wire, which hung free in the sump, was attached a 20 lb. weight to act as a compensator. Harris's Deep Navigation Colliery at Quaker's Yard was thus fitted in 1880, the depth of the south pit to the Four-feet Aberdare seam being 695 yards. The arrrangement of No. 8 wire for the engine plane signals at Risca, North Dunraven, and other collieries was practically the same as an ordinary overhead telegraph line, the special shackle found most suitable being a brown stone ware insulator. For a single road the insulators are spiked at suitable distances into the props on one side of the road, and for a double road into the overhead collars or cross timbers. The line wire passes over the groove of the insulator, and is prevented from running back in the event of a break by a binding wire passing round the insulator. The batteries found most suitable were 12-cell large size Leclanché batteries; the outsides and the insides of the glass cells down to the level of the exciting fluid were well brushed with paraffin oil to prevent efflorescence and evaporation. The evil effect of coal dust in the pit batteries was avoided by pouring a little common engine-oil on the surface of the exciting fluid, thus sealing it from the air of the mine. Great advantage was derived in wet shafts, where the electric leakage was great by duplicating the pit batteries for quantity, and thus keeping the tension low. It is frequently assumed that the greater the battery power the stronger the signals. This is not the case where insulation is defective; the remedy lies in coupling up more cells for quantity, and keeping the tension low.

As to the signals proper, Mr. Bagot explained that the system employed at Cannock and Rugeley Collieries consisted of a single stroke bell circuit, ringing from pit to bank and engine simultaneously, and from bank to pit only, on 9-in. electric gongs of special construction; also a 12-order dial circuit from pit to bank and engine, and again from bank through the engine dial to the pit dial. When winding coal the banksman, using the bell circuit only, rang twice to the cager as soon as he had taken off the full tub and put an empty one on the cage. The cager having received this signal that the banksman had completed his operations, and having also himself taken off the empty tub and put on a full one at the pit bottom, signalled twice to bank and engine simultaneously, thus warning the banksman that he had signalled the engine driver to start. In practice this has been found far safer and quicker than the prevailing custom of the banksman starting the engine driver. For the purpose of signalling the driver to stop, the banksman was provided with a local bell circuit from bank to engine only; but in all cases, except when the sinkers were in the pit, the starting signal was taken from the cager only. The electrical transmission of special orders is effected by the two-dial circuits previously mentioned, the current being supplied from the batteries required for the bell service. Provision is further made if necessary for electrically interlocking the kips with a semaphore in the engine room, so that when the kips are withdrawn by the banksman to allow of the free passage of the cage, the arm of the semaphore is moved from "on" to "off" by the action of an electric current automatically transmitted from the banksman's battery at the moment of pulling over the lever. This semaphore thus indicates automatically to the driver in foggy weather the operations of the banksman. In engine plane signals the bell signals are made at any part of the road by simply making connection between the line and the return wire, and thus closing the circuit; this can be done by the boy in charge of the journey while the tubs are running. Another application of electricity in coal mines is the electric recording anemometer introduced by the writer. The hemispherical rotating cups are placed in the main return airway, and the recording apparatus in the fan engine room at the surface. This apparatus consists of suitable clockwork to pay out a given length of paper tape in a given time. Every five minutes the clock closes a local electric circuit within the apparatus, and thus the time is punched on the tape. The revolving cups in the return airway are geared into a revolving wheel so insulated that it makes contact once in so many revolutions.

The second part of the paper was devoted to the consideration of the question of the application of electricity in mining for illumination and for transmission or storage of power. The author stated that in 1881 he experimented at length on the illumination of the pit bank and screens at Harris's Navigation Collieries. A Gramme dynamo machine was driven off an engine that worked a Schiele fan, thus ensuring great steadiness of motion and economy in motive power. The result of the experiment showed that incandescent lamps were useless, and powerful arc lamps, fixed at 40 feet above the ground, the most suited for the purpose. On account of the absence of colour in the light, the coal trimmers could pick off brass and pyrites quicker by the arc lamps than by incandescent lights. In every way the experiments proved conclusively that electric illumination of the surface was desirable at a mine of any great magnitude, and that the ordinary engineering staff of a colliery was capable of maintaining the appliances in operation after a week's instruction; but it was generally agreed that the introduction of alternating high tension current machines was very unadvisable on account of the likelihood of accident to the men. For underground illumination electricity appears to be altogether inapplicable. Mr. Bagot remarks that at the Risca Collieries the electric light is introduced into the pit from a dynamo machine driven at the surface. The cable is taken down the shaft, and connected with a series of Crompton incandescent lamps of large size at the bottom. These give an excellent light, and facilitate very greatly the work of the cagers and the men in the gate roads. But as regards the introduction of such lights into coal mines for the purpose of illuminating the working stalls and faces, there are serious obstacles. It must be borne in mind that with safety-lamps a constant watch is kept on the appearance of gas. Now, a blower of gas has been known by the writer to back up against an air current of 65,000 cubic feet per minute passing down the split, and with electric lamps no notice would be given of the fact. Such accidents—or again, a fall of roof breaking a wire, or the breakage of a lamp—cannot be guarded against; and hence the writer is of opinion that no increased safety would be afforded by the electric illumination of the working faces from dynamo machines. The danger of breaking line wires may, indeed, be avoided by the use of accumulators or secondary batteries, charged at the surface from a dynamo machine. But it is stated that 30 Faure accumulators, weighing in all about 2 tons, were required to illuminate by means of incandescent lamps the Pullman express on the London, Brighton, and South Coast Railway between Brighton and London. Hence the applicability of such batteries in their present state to coal mines seems very doubtful.

The useful application of electricity for the transmission of power would be confined to underground haulage on the electrical tramway principle; but according to Mr. Bagot's information such engines as those constructed at the Grange Ironworks, Durham, or compressed air locomotives, are capable of being used far more economically than electricity, so that the question of electric haulage need not be considered. At the Cannock and Rugeley Collieries the cost for haulage with compressed air is ¾d. per ton. The air is first compressed to 75 lbs., and ultimately to 350 lbs. per square inch for use in the locomotive; and by having an excess of receiver room all difficulties of latent heat are avoided. The cost of the locomotive was 250*l.*, and that of the compressor 70*l.*, and the engine does the work of three 14-hand horses. The cost of producing an equal amount of power by means of electricity would be more than twice that sum, and the electrical leakage in coal mines would be an almost insurmountable obstacle to its use. Steam hauling engines and compressed air locomotives, with the tail rope system in use at many collieries, have proved so satisfactory and economical that the time has not yet arrived when electricity can be economically applied to take their place, whilst the transmission of power to fixed points in coal mines is undoubtedly best secured by means of compressed air, the exhaust of which is of such value for ventilating the workings. Recapitulating the conclusions, it appears that Mr. Bagot advocates the use of electricity for the purposes of signalling and illumination as regards the pit bank and pit bottom, but cannot at present approve its adoption for the transmission of power in the workings, or for illumination at the working faces. He is of opinion that no increased safety would be thereby derived, and that inconvenience and danger might arise through falls of roof, whilst the constant watch upon gas, kept by the present extensive use of self-extinguishing lamps, would be removed. He considers that the application of electricity for surface illumination is only a convenience, and not a necessity, while for underground illumination he adheres to self-extinguishing safety-lamps.

In the course of the discussion which followed the reading of the paper, Mr. Tresca remarked that he had himself made some experiments, in the course of which, with a Gramme machine, 31-horse power had been transmitted to a considerable distance. Indeed, he thought there was scarcely any limit to the distance to which power could be conducted by electricity except that resulting from the loss necessarily produced by the conductor. He did not think that the working of a locomotive by electricity was destined to accomplish any great success; but he thought that the application of electricity in the interior of mines would be attended with great advantage. After making all deductions for loss he thought that at a distance of 500 or 1000 metres it was impossible to rely on a greater result than 60 or 70 per cent. Mr. Cochrane concurred with the view that the application of electricity in tunnels was likely to prove very useful. He had had the opportunity of seeing the tunnel referred to by Mr. Tresca, and was pleased with the excellent way in which it was lighted at intervals of about 40 yards. The glasses being protected by wire to prevent accident, he thought that a similar method might be adopted in tunnels on English railways. Mr. Bagot appeared not to have observed the fact that in Belgium men were working without having any sight of the mouth of the pit, and relying entirely upon the dial.

DISTILLATION OF COAL.

The admixture with coal previous to its distillation of lime in the form of quick lime, carbonate of lime, or spent lime has been patented by Mr. W. J. Cooper, of Westminster. In carrying out the invention coal, either in conjunction with one, or with more, of the above-named forms of lime, is submitted to distillation, the said forms of lime being in such a proportion as shall, when the mixture is subjected to distillation, produce a greater quantity of ammonia and of ammoniacal products, or of tars, or of gas, than is now obtained. To the coal either in a lumpy condition (such as that in which coal is used in gas making) or by preference in a state of fine division he adds lime in one or more of the forms named, and he causes the mixture to be well incorporated.

The mixture thus prepared can then be employed either in gas retorts, coke ovens, or furnaces. When he employs the mixture in gas retorts in gasworks he finds it convenient to employ about ½ cwt. of quick lime to every ton of coal, and to grind or crush the lime and coal together using for that purpose a disintegrator or other suitable machinery. The small coal or slack which has comparatively little commercial value as coal is especially available for the purposes of invention. When he employs carbonate of lime (chalk), or spent lime he finds it convenient to use at least 1 cwt. to the ton of coal.

Some of the advantages claimed for the invention when it is applied in gasworks are:—An increased yield of ammonia and ammoniacal products. An increased yield of those compounds which impart illuminating power to gas, and consequently an increased yield of illuminating gas or of tar. A diminution of the impurities in crude gas—*i.e.*, in gas as it issues from the retort, and consequently a diminution of the cost of gas purification. The resulting coke is for certain purposes improved. He remarks with regard to the increased yield of ammonia that, owing to the strength of the ammoniacal liquor, it will be advantageous to run water (in as cool a condition as possible) into the condensers to dilute the liquor to a strength at which it will not readily part with its ammonia; about 10 gallons of water to every ton of coal carbonised is a suitable proportion. What he wishes to be understood as spent lime is what is known in gasworks as spent lime which is the substance existing in the lime purifiers after it has been exposed to the action of the impure gas.

MINERAL RESOURCES OF QUEENSLAND.

The admirable and carefully-prepared statistics of the colony for 1881 which have recently been published, and for a copy of which we are indebted to the Queensland Government, show that the colony is making satisfactory material progress, and that so far as the mineral industries are concerned enough has been done to show that there is an ample field for profitable enterprise. During 1881 there were 174 tin mines in operation, which produced 106,448 tons of ore, of the value of 2,168,790*l.*; the three copper mines produced 3220 tons of ore, worth 552*l.*; there were ten lead mines which produced 418 tons of ore, and 647*l.* was received in the colony, but of the quantity mentioned 384 tons were forwarded to England for smelting, showing net proceeds of lead and silver, 12,905*l.*; there were six antimony mines which produced 335 tons of ore, worth 3665*l.*; the two manganese mines produced 87 tons of ore, worth 261*l.*; there were fifteen coal mines which produced 65,612 tons of coal, worth 29,033*l.*; in the Ipswich district 1400 tons of coke were made not included in these figures. One marble quarry produced 300 tons, worth 150*l.*; there were three quarries which produced 19,598 tons of felstone porphyry, worth 1942*l.*; there were five quarries which produced 33,592 tons of bluestone, worth 5019*l.*; and there were ten freestone quarries which produced 7925 tons, worth 6715*l.* This is exclusive of the principal mining industry of the colony—gold—of which no less than 200,134 ozs., worth 700,469*l.*, was obtained. This was raised by 2750 miners, showing that the get was 72 ozs. 10 dwts. 11 grs. per man, so that the miners' average annual earnings were 252*l.* per man.

The yield of gold from the veinstone of the Charters Towers gold field during the year has maintained its remarkable evenness. Six escorts were run during the year, conveying a total of 82,323 ozs. 18 dwts. 23 grs. of gold; this is nearly 3000 ozs. less than in the previous year, and must be ascribed to the fact of one of our most productive mines having been kept at next to a standstill for nearly three months on account of litigation. There is the usual discrepancy between the mill returns and the escort, and amounts this year to 13,060 ozs. 9 dwts. 22 grs. Of this 2746 ozs. 8 dwts. 18 grs. represents gold brought here from Ravenswood, Rochford, Woolgar, and other localities not comprised in this gold field, and purchased by our banks. The yield from the alluvial ground both here and at the Cape has, he is confident, not exceeded 3000 ozs., which would leave 7314 ozs. unaccounted for; this, therefore, must be the amount of gold obtained by the after treatment of tailings and blanketings which does not appear in the mill returns. With the accession of the new machinery placed on the field during the year ample crushing power is now at the command of the public. The number of stamps has been increased from 130 to 154. New gold-saving appliances have been added, and two rock drills and a Diamond drill have been introduced. The Warden estimates the increase in the value of machinery at 9000*l.* The price of crushing remains at from 12s. to 16s. per ton, which, considering the perfect treatment afforded, must be admitted to be reasonable under present circumstances. To work profitably at lower rates would require much larger mills than are possible with our scanty supply of water. However, he thinks that hereafter if quartz could be conveyed at very cheap rates by rail to the Burdekin in a similar way as coal is carried from collieries to port, a large mill would be feasible in that locality, and probably could be driven by water-power. A good deal of prospecting has been done on the field during the year, and 162 prospecting areas were granted. However, no new discoveries such as would affect the gold field one way or another were made. Several of the prospectors during their search for gold have come across lodes of other metals, but no discoveries of any importance in this direction have been reported to him. Veins of argentiferous galena have been met with, and also thin strings of low percentage copper ore and antimony were encountered. Of course, this is in unison with what in a metamorphic country like this may be expected; but he thinks he will be safe in predicting that no important discoveries in this direction will be made. Charters Towers will have to rely mainly on its gold mines for its future prosperity.

The payable minerals of the Palmer district comprise tin and gold. The estimated produce of gold in 1881 was 51,960 ozs. 5 dwts. 8 grs. The tin shipped from Cooktown during 1881, solely the produce of the Palmer district, was 535 tons; this ore averages about 72 per cent., and realises to the local miner, as before stated, 31*l.* 10s. per ton, or a total of 16,847*l.* 10s. There are no means of comparison so far as regards the production of tin between the years 1880 and 1881 at his command; but with respect to the gold, the decrease of 13,472 ozs. odd is no more than proportionate to the reduction in the number of miners employed, and the yearly restricted area of payable ground. No recent discoveries have been made; the workings now in existence were opened about 1876, and wrought for tin in association with gold as ordinary alluvial claims. In 1879 extended areas were granted for sluicing purposes. About 20 miles E.S.E. of Maytown a bold granite range rises above the surrounding country, pierced with rocky creeks, eventually flowing into the Palmer river. The main creek in which the principal workings exist flows in a bifurcated channel on the western flank of this granite range, forming a strict line of demarcation between the auriferous slates to the westward and the bold protrusive mass of granite from which the tin has been derived. From these auriferous slates a little gold has been mixed with the stream tin in the creeks, but the quantity was never of sufficient importance to make it worth winning except in conjunction with the inferior metal. The largest reported yield of gold to the ton of ore is 2 ozs. 5 dwts.; less than 5 dwts. to the ton does not repay Europeans the cost of separation, though the process is simple and effectual by the employment of plush at the head of the sluice.

The tin is found in water-worn and crystalline cubes, varying from minute particles to pieces exceeding a pound weight. On certain beaches it contains many so-called rubies, and in parts angular unworn masses intermingled with quartz have been found, indicating the existence at no great distance of a lode. Though the numerous creeks running from this granite range have been extremely rich in alluvial tin, they are but shallow and of no great extent; perhaps 50 miles square would cover the known payable area, and of this it is only the creeks, ravines, and flats that repay labour, though tin can be readily perceived in the surface soil throughout the range to its summit, and pieces of more than 13 ozs. in weight have been picked up many hundred feet above the level of the main creek. Still nearer to Maytown—say 16 miles E.S.E. on Cannibal Creek, itself a tributary of Granite Creek—lie some detached deposits of stream tin, limited in extent, and evidently derived from a large stanniferous outcrop, running east and west; this outcrop, which is visible for half a mile, has been feebly prospected by three shafts, varying from 25 to 40 ft. deep. From surface view this outcrop apparently consists of a number of parallel veins of quartz, strongly impregnated with tin, and looking at no great depth as if they would join and form a persistent lode.

At intervals from the surface to the greatest depth yet attained, 40 ft., bunches of rich ore, from a few pounds to 7 or 8 cwts., are found, and as the lode heads straight for the granite range, where the largest deposits have been found, in any locality but Northern Queensland it would have been properly prospected, and the Warden believes have repaid outlay. Granite Creek runs for about seven months in the year, and the general dryness of the district from its elevation greatly impedes mining, and precludes treating the poorer alluvium. Personally he has washed 13 ozs. of tin ore to the dish of dirt, but in the early days as many pounds have been got from a like quantity of soil. No lode is worked except the lode referred to on Cannibal Creek; that is simply picked, dressed with a hammer, and packed to port. There is no mode of ascertaining the aggregate yield of the tin area. The stanniferous country is fairly timbered with bloodwood, gum, ironbark, bastard stringybark, cypress pine, Leichhardt, and box. The temperature is much lower than that of the surrounding country owing to the elevation of the granite range. If water could be raised to the summit of the range an immense area of surface ground would be available for sluicing, by which process, moreover, many lodes now buried under the surface soil would stand a chance of exposure. Under the present tenure, however, of miners' rights, there is no probability of capitalists investing in such an undertaking.

The Hodgkinson and Mulgrave gold fields appear to be progressing satisfactorily. In the Ravenswood gold field 27 new claims have been laid off during the year. With regard to the Etheride and Woolgar gold fields, the Warden reports that he considers the Etheridge presents a good field for the investment of capital in working its gold-bearing mineral lodes with improved gold-saving appliances; but the best method of treatment will in most instances only be arrived at by careful analysis of the particular ore to be operated on. Many of the reefs, in addition to the principal ingredients, lead and sulphur, carry silver, copper, iron, zincblende, antimony, and other metals. The combination of these metals has up to the present prevented the separation of the gold by the best mill treatment. The success attending the operations of the Cumberland plant is only an example of what might be done with many other reefs on the field with similar appliances, and with treatment varying with the characteristics of the ore to be operated upon. The average earnings of quartz miners, calculated on the basis of the Mint value of gold obtained during the year by crushing and estimated number of miners working, gives a gross return of 372*l.* 1s. 6d. per man. The rate of wages for working miners has continued to be 4*l.* per week of 44 working hours; skilled mechanics receive 1*l.* per day. Labour has always been difficult to obtain, and he believes a considerable number of men would find employment at these rates. The district has continued to be healthy, and only twelve deaths, three of which were accidental, have occurred in an average population throughout the year of about 1000.

Minerals other than gold are known to exist in great variety in this district, but owing to its distance from the coast, the high rates of carriage prevailing, and the difficulties in the way of treating ores on the ground, they have attracted little attention. Galena carrying silver is found in abundance on the field. Near Gilberton three parties of men are opening galena lodes, from which some good assays of silver have been obtained. An attempt is now being made to obtain the assistance of capitalists in working these mines; the work at present being done is only experimental. At the Percy river rich bismuth ore is found in gullies formerly worked for alluvial gold; from assays he had made this ore showed over 72 per cent. of metallic bismuth, with a small percentage of gold and silver. Three men worked this ground for some time, and stacked a large quantity of washdirt containing ore; they also discovered a reef carrying the ore in small quantities. The absence of a market for the ore in the colonies, and the uncertainty as to the price obtainable in England, have had the effect of discouraging miners, and work has now been discontinued.

The Woolgar has again come prominently into notice during the latter part of the year, owing to the promising appearance of the quartz reefs opened on the Woolgar Creek about ten miles below the principal alluvial workings. There are now 15 lines of reef opened, and 30 claims being worked by about 60 quartz miners. Over 800 tons of stone are raised and waiting crushing. The first crushing of about 200 tons from the prospectors' claim is now being passed under the stampers at the Pioneer mill. This mill, which consists of five stamps driven by a 10-horse power engine, has just been erected by Messrs. Crapp and Co. The alluvial ground appears to be too poor for European labour, only 15 miners being now at work on it.

With reference to the Gympie gold field, the Warden remarks that his report of mining operations on Gympie for the year 1881 will show the most satisfactory results of any year since 1869. The yield of gold is one-third more than the average for the past ten years, while the prospects indicate a further large increase for the year 1882. At the commencement of the year very little auriferous stone was being raised, the various crushing machines running not more than half time, whilst now they are all constantly employed day and night, and yet the stone is accumulating, there being now about 2000 tons ready to go under the stampers. Early in the year the heavy finds in the No. 1 North Phœnix and the discovery of a third bed of slate in the No. 7 South Lady Mary at the 640 feet level, with an auriferous reef running through it, operated most beneficially on the field generally. The Phœnix discovery added at once over 150,000*l.* to the working capital, and the Lady Mary discovery gave increased confidence to investors in the stability of the mining industry. The consequence was that very many new companies were formed to work ground that, although well situated, had remained untested or only partially so, and reefs that had formerly yielded well, but from the inefficient appliances then used could not be worked at a profit. Although there is no doubt that some of these companies were floated by the promoters solely for the purpose of making money in the share market by the sale of scrip, yet so good are the prospects of all the ground so taken up that out of 112 companies registered during the year only 20 have collapsed, all the rest prosecuting their undertakings with a steadiness of purpose previously unknown on Gympie. This no doubt is in a great measure owing to the considerable amount of interest now taken in Sydney and Brisbane in Gympie mining. In both places a large amount of scrip is now held; and from the results of the past year's investments Gympie stock will be looked upon, he has no doubt, with increased favour in both places.

The alluvial ground on the Normanby gold field was worked by about the same number of miners during 1881 as during the previous year. The miners have only been able to make a living, as a good deal of the ground has been worked, and the untried area is much more limited in extent. The gold, too, is very fine—not coarse nuggety gold—and the appliances used are of a primitive kind. The Warden has no doubt a good deal of the fine gold is carried off in the washing, and if improved means of saving it were within reach of the miners much better results could be obtained. The water, also, is a great hindrance to the alluvial miners here; even in a dry time it is sometimes more than they can contend with in the ordinary way, by windlass and buckets. He granted and registered several protection areas during the past year for prospecting for quartz reefs. Several apparently good reefs were found, but the difficulty so far has been to find reefs that will go down to any depth; they "pinch" out at various depths. One was sunk on the year previous, and followed to a depth of over 35 ft., then lost, and the ground became very hard; when this occurs the risk and expense are increased so much that persons with limited means do not like to incur them. The reef that has been proved to have given the most encouraging yield up to the present is the Welcome reef. He granted the prospectors of this reef a reward claim for their discovery; they sent 3 tons of quartz from it to the Standard crushing machine, Boolboonda, early in last month, and the result was satisfactory. There were 3 tons 2 cwts. 2 qrs. of stone, and the yield from it was 4 ozs. 5 dwts. The prospectors have sunk a shaft of about 35 ft. The reef is not as good at this depth as it was at a less depth, and it remains to be seen whether it will improve as they go down. The reef is not solid at the depth named, but the walls are well defined, and the sinking as yet good.

The principal reef on the Molangool gold field is the Pioneer. At the beginning of last year mining operations were carried on on several reefs, but they are now chiefly confined to the first-named reef and the West Yorkshire. The best claims up the present have been some of those on the South Pioneer. The deepest shaft sunk on this reef is about 100 ft., but the stone from this depth has not been tested yet by a crushing. There are two machines on the ground—the Phœnix and the Lady Mabel—of 10 stampers each. The owners of the Phœnix have lately put up a Berdan pan to enable them to treat the stone more effectually. The extreme dryness of the season has been greatly against the machine owners, and has also been a great hindrance to the miners, as very little stone has been crushed for the last three or four months, owing to want of water to work the machines.

MINING AND METALLURGICAL PROGRESS.

The metallurgical processes of the present day are not up to the standard required by the position and importance of the mining industry. This position, says the Idaho World, is, doubtless, largely due to the fact that scientific men have not given the subject the attention which its importance demands, and the business has been conducted to a large extent at a remote distance from business centres, and the presence of skilful and well-informed men. Under the present methods the element of loss is too great a factor—loss of time and valuable material. In many localities the most primitive methods and agencies are in use in the reduction of ores; appliances that show no improvement in the whole history of mining for centuries.

In almost any other department of the mining industry, especially in the working of mines, a marked advance is everywhere apparent. The compressed air-drills, the steam hoisting machinery, the improved explosives, and all the arrangements for mining the ore, show but slight resemblance to those in use even a few years ago. As mining comes more and more a productive industry, and is operated in a legitimate manner for the development of mineral resources, the condition of facilities, and the unsatisfactory results of present processes for the reduction of ore must demand attention, and compel a revolution in means and methods. The product of the mines of the country is estimated from the portion of mineral that appears in the channels of industrial and commercial activity. If to this utilised portion could be added that which has been lost between the mouth of the shaft and the bullion mould the result would be surprisingly different.

The decrease of the gold produced in California during 1882 is estimated by the United States Treasury Department to amount to 200,000*l.*, and the Idaho World considers that it is more than probable that the tailings of mill and flume have borne away more than five times that amount within the year, and the annual loss of precious minerals under present methods of treatment would more than pay the cost of all investments made. Under careful management the waste dump, slag pile and tailings, even with prevalent means, have in many instances given better results than the mine from which the ores were taken. This ruinous factor of waste must be eliminated before the problem of successful mining be definitely solved.

ZINC FOR PREVENTING STEAM-BOILER CORROSION.—Some further improvements upon his invention of June, 1881, have been made by Mr. J. B. HANNAY, of Glasgow. The zinc masses of spherical, or spheroidal, or polyhedral, or cubical form, or other form having small difference of thickness in different directions, are rendered more durable and efficient by being brought into the condition known as malleable, instead of being used in the condition they have when simply cast. For this purpose the masses are hammered or forcibly pressed or rolled, the operation being by preference effected suddenly. Thus a convenient and satisfactory means for the purpose consists of a powerful screw press fitted with a heavy fly-wheel or heavily weighted arms and provided with suitably shaped dies. By a further improvement the zinc is made more susceptible of being rendered malleable by being alloyed with a small portion (say) not more than 10 per cent. of lead, tin, or copper. Another improvement consists in carrying each of the zinc masses in the boiler in an iron ladle of suitable size, such ladle being clamped to some of the tubes or fixed inside the boiler in any convenient way, and not requiring to be removed when supplying new blocks or balls of zinc, as such blocks or balls have simply to be placed in the ladles after these have been cleared out.

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Registration of New Companies.

The following joint-stock companies have been duly registered:—

South Minnesota Land Company (Limited).—Capital 250,000*l.*, in shares of 10*l.* The purchasing and acquiring of land in said State for the purpose of carrying on the operations of a land company. The subscribers (who take one share each) are—H. M. Keyworth, Liverpool; J. Sturt, Dalston; W. J. McVeagh, 3, Crystal Palace-road; G. Willock, jun., 4, Bishopsgate-street Within; F. L. Hutchins, 11, Birchin-lane; W. B. Close, 4, Bishopsgate-street Within; H. D. Dunlop, 4, Bishopsgate-street Within.

Hornchurch Brewery (Limited).—Capital 70,000*l.*, in shares of 10*l.* To acquire and carry on an established business at Hornchurch, Essex. The subscribers are—R. Tennant, 31, Clanricarde Gardens, 50; J. N. McKenna, 67, Lancaster Gate, 50; H. Holmes, Hornchurch, 50; B. Holmes, Hornchurch, 50; J. K. Rowbottom, Dashwood House, 1; S. Grant, St. Michael's Alley, 1; E. F. Rickman, 2, Moorgate-street, 1.

The Shipping Trust (Limited).—Capital 250,000*l.*, in shares of 10*l.* To acquire steam and other ships and vessels, to re-sell same, or carry on generally a shipowner's business. The subscribers (who take one share each) are—F. A. Davidson, 49A, Alderney-street; W. A. Spence, Walthamstow; J. Barrowman, 66, Holborn Viaduct; G. T. Jellico, 136, Evering-road; C. S. Robertson, 45, Finsbury Pavement; C. J. Carton, Balham; A. Ash, 68, Coleman-street.

The Electric Brush and Appliances Company (Limited).—Capital 10,000*l.* in shares of 1*l.* To acquire various patents granted to J. N. Aronson, and to carry on the business of an electrician in all branches. The subscribers (who take one share each) are—J. F. Jumer, 29, Blenheim Grove; C. Finch, Hornsey; R. Lewis, 47, Lothair-road; C. Richards, 29, Tichbourne-street; R. Henderson, 156, Hornsey-road; M. Levy, 3, Finsbury-terrace; C. Pinder, 7, Cornwall Mansions.

The Anglo Italian Iron and Mining Company (Limited).—Capital 500,000*l.*, in shares of 20*l.* The acquisition of concessions, rights, and privileges for working mines situated in the district of Tolfa, near Civita Vecchia, and the plant, stores, and effects belonging thereto; and also the acquisition of foundries, works, and premises situate at Terni, near Rome, for the purpose of carrying on the trade of miners, smelters, founders, metal merchants, or agents, iron and steel shipbuilders, manufacturers of rails, ordnance, boilers, and metallic goods of every description, engineers and dealers in the produce of mines and quarries, &c. The subscribers (who take one share each) are—C. Plowden, Rome, banker; S. B. Coxan, 7, Western Chambers, M.E.; E. Berner, West Hartlepool, shipowner; J. W. Brewis, Newcastle-on-Tyne, accountant; C. W. Hutchinson, Newcastle-on-Tyne, mechanical engineer; F. Tallack, Great St. Helen's, shipbroker; H. Peace, 176, East India-road, ship commander. The number of directors must not be less than three or more than 10. Future directors will have to qualify in 20 shares.

The British Shipping Investment Company (Limited).—Capital 100,000*l.*, in shares of 5*l.* The usual business of shipowners, exporters, and importers, &c. The subscribers (who take one share each) are—J. Hay, Liverpool; N. P. Furseman, Devonport; J. O. D. Wolfe, Liverpool; R. Stoddard, Southport; G. Adam, Liverpool; W. Adam, Welshpool; J. K. Hollingdrake, Manchester.

The Parcels Post Insurance Company (Limited).—Capital 50,000*l.*, in shares of 5*l.* To insure against all losses arising to parcels, &c. The subscribers (who take one share each) are—H. E. Boot, 24, Old Bailey; F. H. Beer, Sydenham; E. Pitman, South Hackney; W. Mitchell, 86, Curtain-road; D. Tolmie, 484, Old Kent-road; J. Smith, jun., 16, London-street; W. S. Pound, West Dulwich.

The House Drainage (Durham's System) Corporation (Limited).—Capital 100,020*l.*, in shares of 1*l.* and 5*l.* To carry out in the United Kingdom and elsewhere the system of house drainage known as "Durham's System." The subscribers (who take one share each) are—H. A. Lane, Telford Park; R. Buchan, West Hackney; J. P. Prince, Crixton Rise; C. W. Durham, 14, Strand; F. B. Wilson, 449, Strand; W. Jackson, 20, Denbigh-road; A. Dexter, 5, Suffolk-place.

The Nantmelin Colliery Company (Limited).—Capital 12,000*l.*, in shares of 100*l.* To adopt and carry into effect an agreement made between Margaret Jones of the one part, and James L. Thomas of the other. To acquire by purchase or otherwise certain property situated in Glamorganshire, and the working, raising, manufacturing, and selling of coal, coke, iron, ironstone, blackband, and fireclay, or any other like substances found in said or any other property belonging to the company. The subscribers (who take 10 shares each) are—T. Crawshay, Cardiff, gentleman; J. Corry, Cardiff, colliery owner; R. Corry, Cardiff, colliery owner; J. R. Jones, Lower Croydon, colliery owner; H. James, Cardiff, coal merchant; W. Thomas, Aberdare, M.E.; J. L. Thomas, Aberdare, M.E.; T. B. Heywood, Reigate, gentleman. The subscribers will name the first directors; qualification the holding of shares to the value of 500*l.*

The Felixtowe Gaslight Company (Limited). — Capital 6000*l.*, in shares of 5*l.* To erect gasworks and supply said town and district with light, &c. The subscribers are—G. Tomline, Felixtowe, 100; F. J. Bugg, Ipswich, 20; W. Jolly, Felixtowe, 20; T. Ward, Felixtowe, 20; W. G. Archer, Felixtowe, 20; R. M. Miller, Ipswich, 20; F. P. Bugg, Ipswich, 5.

Whitwood Chemical Company (Limited).—Capital 200,000*l.*, in shares of 100*l.* To manufacture from coal and other minerals, coke, gas tar, oil, spirits, acids, dyes, patent fuel, &c. The subscribers (who take one share each) are—R. Younge, Alderley Edge; A. Meek, Brough; R. Dumpster, Elland; H. Broadbent, Southport; W. E. Jackson, Normanton; J. Ingram, Wakefield; J. Dempster, Elland.

The Falcon Mining Company (Limited)—Capital 15,000*l.*, in shares of 100*l.* The acquisition by purchase or otherwise of mines or mineral properties, and in particular of royalties and mines and qaarries of iron ore, ironstone, copper, lead, limestone, fire-clay, common clay, freestone, or any other mineral or material; and rights, shares, or interests therein, and to carry out an agreement made between R. Falcon of the first part, the directors of the Wyndham Mining Company (Limited) of the second part, and H. Woolcock, of Whitehaven, M.E., of the third part. The subscribers (who take one share each) are—R. Falcon, Eskmeals, landowner; J. Kitchen, Whitehaven, corn merchant; A. Helder, Whitehaven, solicitor; J. S. M'Gowan, Whitehaven, timber merchant; J. Gunson, Whitehaven, draper; J. Adair, Whitehaven, mine manager; H. Woolcock, Whitehaven, C.E. The first board comprises the following:—J. Kitchen, A. Helder, J. S. M'Gowan, J. Gunson, J. Adair, and H. Woolcock.

Kent and Essex House, Land, and General Investment Company (Limited).—Capital 25,000*l.*, in shares of 5*l.* The usual business of a land company and building society. The subscribers are—D. Bartlett, Gravesend, 20; J. Copelin, Gravesend, 20; J. Jones, Gravesend, 10; J. W. Brown, Gravesend, 25; E. C. Nairn, Gravesend, 10; A. Horncastle, Grays, 20; G. Quinton, Gravesend, 10.

The Suburban House and Land Company (Limited).—Capital 100,000*l.*, in shares of 5*l.* The usual business connected with a land company and a building society. The subscribers (who take one share each) are—W. H. Charlton, 11, Queen Victoria-street; H C. Burskell, 13, Queen-street; W. L. Bernard, New Court; W. T. Hirst, East Dulwich; A. B. Daveney, Brixton; T. Warne, 33, Wicklow-street; J. G. Lyle, 57, Bishopsgate-street Within.

Bull's Power Company (Limited).—Capital 1,000,000*l.*, in shares of 1*l.* To carry on the manufactory of gas and steam engines, evaporators and generators, and the business of engineers, copper and iron founders, &c. The subscribers (who take one share each) are—H. C. Bull, Liverpool; J. J. Warry, Birkenhead; E. Barrow, Liverpool; W. H. Strype, Liverpool; J. Perkins, Birmingham; J. Warry, Birmingham; R. L. Roberts, Liverpool.

The Cable Tramways Construction and Conversion Company (Limited).—Capital 200,000*l.*, in shares of 10*l.* To construct, lay down, equip, maintain, and work tramways, railways, &c. The subscribers (who take one share each) are—L. Bishop, 99, Cannon-street; W. Maguay, 8, Milton-street; G. A. Brooker, 4, Sussex-place; A. J. Davis, Hornsey; R. G. Graham, Hampton; W. L. Boyle, 80, Lombard-street; C. Hinksman, 117, Great Russell-street

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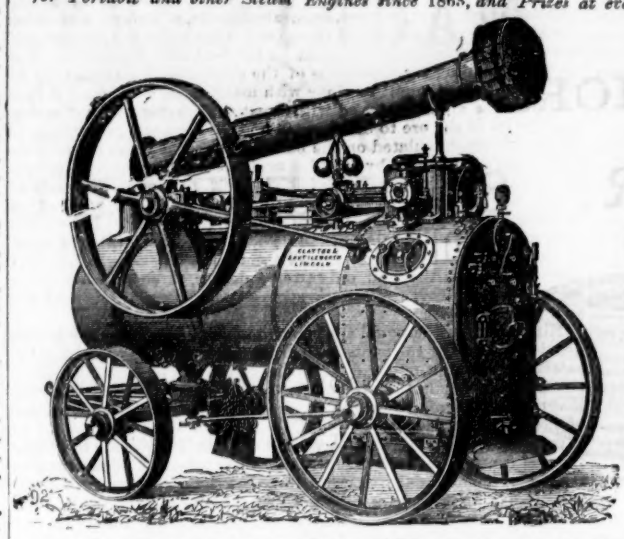

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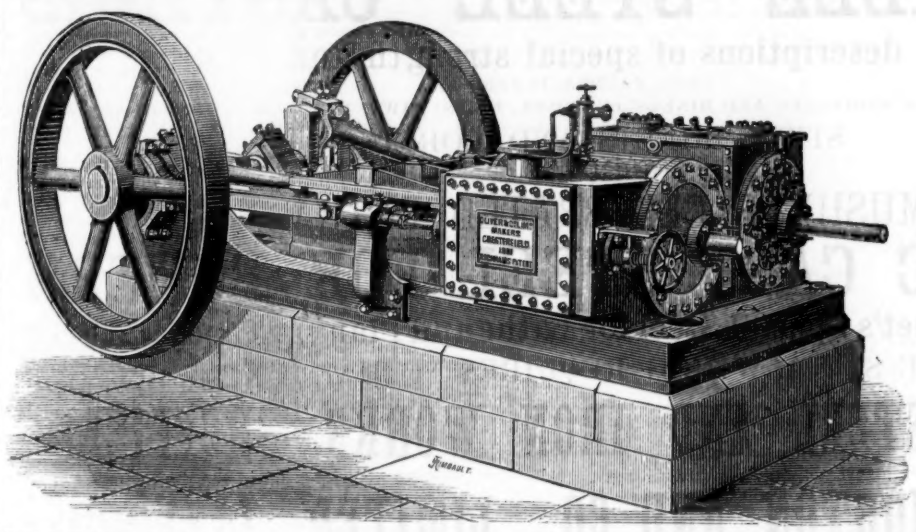

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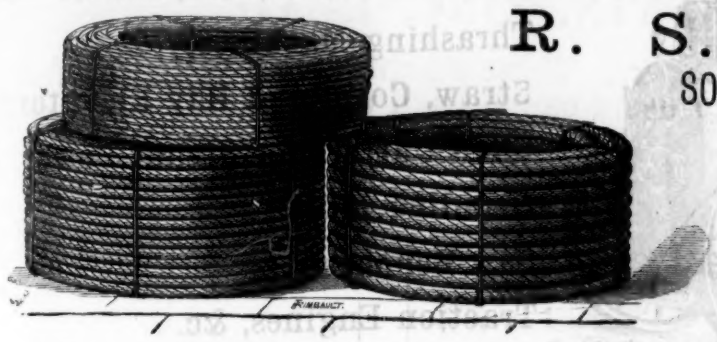

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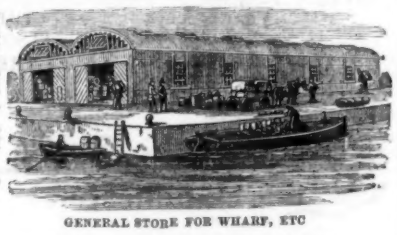

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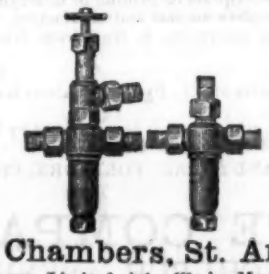

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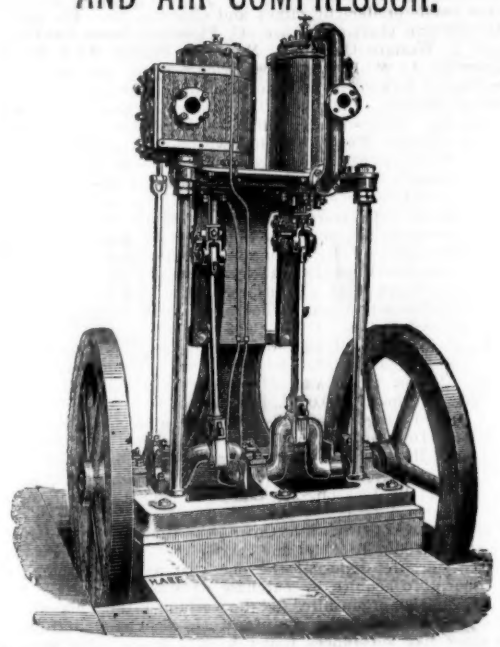

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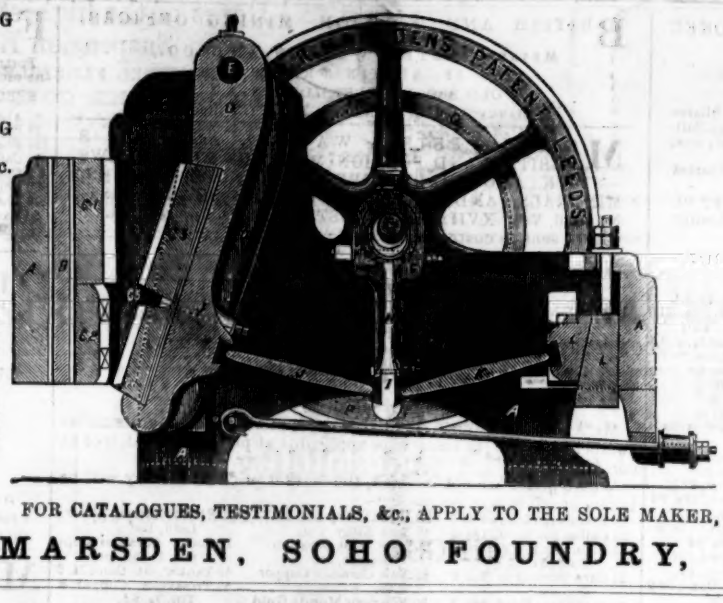

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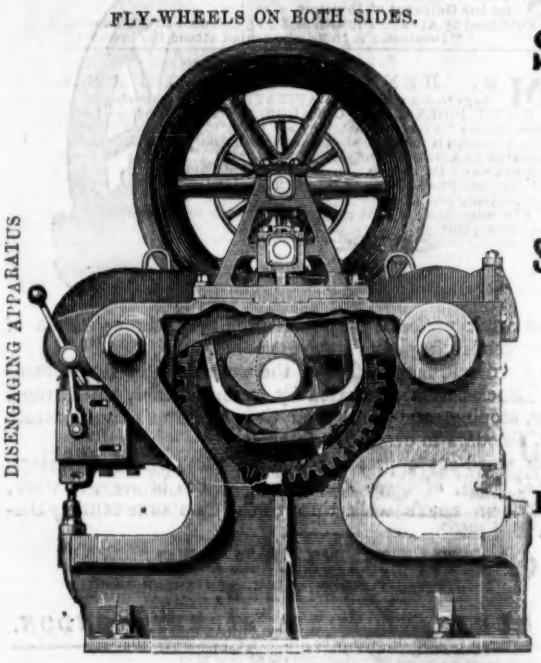

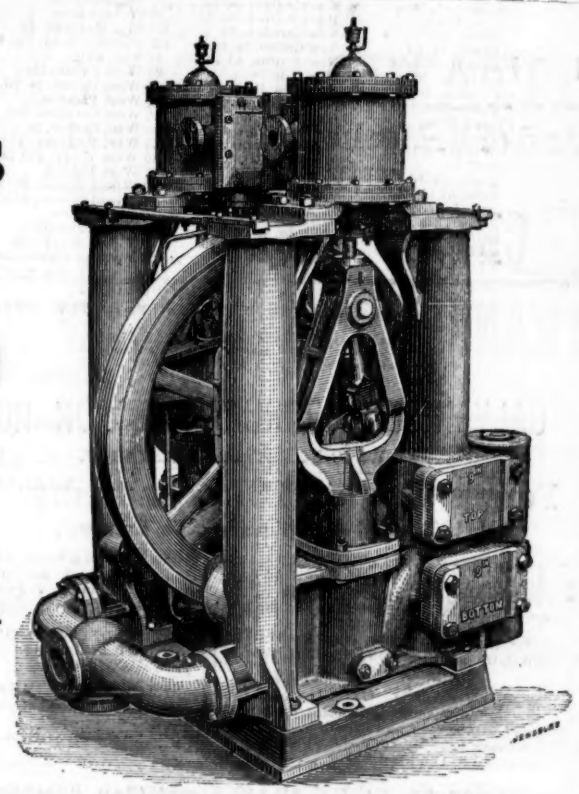

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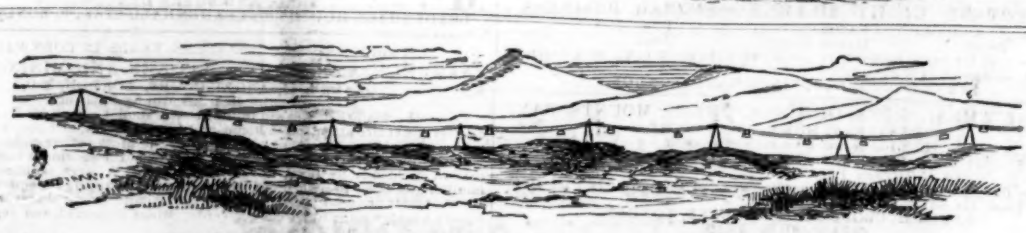

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